The Builder.

VOL. LXXXVIII.—No. 3239. MARCH 4, 1905.

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The Building Act Amendment Bill and its Critics.

WHEN, some three months ago (see the *Builder* of November 19, 1904), we devoted some space to the consideration of the changes which would be brought about by the proposed new Building Act for London, we observed that our comments were based not on the actual wording of the Bill, which was not then published, but on the Report of the Building Act Committee of the London County Council, which only detailed the special points as to which alterations were proposed, and the nature of these alterations. Most of these we were disposed to regard favourably; at all events we saw nothing in them to give occasion for the hostile spirit in which the Bill has been assailed in many quarters, and in which professional interests have, with many critics, manifestly been put before public interests, which form the real business of such a Bill. But we certainly had not anticipated at that time that the proposed Bill was to take the form mainly of an elaborate amendment to the London Building Act (1894), that the two were to be read together, and that people concerned in building operations were to have the inconvenience put upon them of consulting and comparing the language of two Acts in order to find out their duties and liabilities. Yet such is the case. The general form of the Bill as it now stands complete is, that wherever there is an alteration of a provision in the Act of 1894, we are referred back to that Act, and directed that such a clause in it shall be read and have effect "as if the words" so-and-so "had been inserted therein immediately after the words" so-and-so; the insertions consisting sometimes only of a word or two changing the purview or effect of a clause, sometimes of a whole long sentence constituting a new clause in itself. The excuse for this is, we presume, that a demand for an entirely new Act might probably be met by the criticism that the existing Act was not much more than a decade old, and that to require a new Act after so short a lapse of time was unreasonable. We can imagine no other explanation or apology for a mode of legislative enactment which is in the highest degree clumsy, inconvenient, and indeed preposterous. Whatever may be thought of the effect of the proposed legislation, the manner of it is entirely indefensible; it is placing upon those who are obliged to conform to it the onerous business of consulting and comparing two Acts before they can be sure what their obligations are. No such inconvenience to the public ought to be tolerated, and an important Bill drawn up on such a principle, whatever its effects may be, is self-condemned in regard to its form. If London building law requires so much amendment as is implied in this document—and we think it does—the existing Act ought to be repealed and whatever is retained of its provisions embodied in a new Act consolidating the existing and amended provisions. So far we are entirely with the adverse critics, and we do not believe that a Bill drawn up in such a form can ever have a chance of passing.

This is not to imply, however, that we are by any means in sympathy for the most part with the opponents of the Bill. We object to its form, which is radically wrong; with much of its substance we are quite in agreement; and we object to the spirit in which it seems to have been opposed. The object of a Building Act for London is to benefit London and its public at large; not to benefit architects and surveyors or even their clients the building-owners, who after all are but a small proportion of the public. We are told that building will be rendered more difficult and more costly; but if that ensures better building and a better London, it ought to be rendered so. The objections embodied in the Petition of the Institute of Architects against the Bill, which have just been published in the *Journal* of the Institute, seem to go far too much on the assumption that the public are made for the architects, whereas in fact it is the architects who are made for the public: at all events, they will hardly get the public to think otherwise. And the summing-up sentence at the close of the Petition to the effect that "the public interest represented by the Institute" ("interests" we suppose it should have been) "and their own rights and interests are injuriously affected by the provisions of the Bill above referred to and that the Preamble of the

Bill so far as it relates thereto is incapable of proof," is not a wise statement to have made, and will not bear examination. Of course it is a usual conventional method of attacking a Bill to urge that its Preamble is not proved, or not capable of proof; but what is the Preamble of this Bill?

"Whereas the provisions contained in 'The London Building Act 1894' as amended by 'The London Building Act 1894 (Amendment) Act 1898' and the powers thereunder of the London County Council (in this Act referred to as 'the Council') are insufficient to secure the construction and maintenance of streets and buildings in the Administrative County of London in a satisfactory manner the provision and maintenance of proper means of escape in case of fire from such buildings and the reduction of the risk of fire in the case of such buildings.

And whereas it is expedient to amend the said provisions in the manner hereinafter set forth and to confer upon the Council such further powers with respect to the matters aforesaid and otherwise as are hereinafter contained.

And whereas the objects aforesaid cannot be effected without the authority of Parliament:"

That is a moderate statement enough, and on general grounds it cannot well be traversed. The phrases in the sentence from the Institute Petition, referring to "the public interest represented by the Institute" and "their own rights and interests" mean really, we take it, the same thing; the Institute petitions as a section of the public which considers the Bill injurious to its interests. In some senses it may be, and the Institute of Architects is an important body; but after all, Acts of this kind are not supposed to be framed in the interests of any corporate body, however important, but in those of the public at large.

The first thing we are struck with in the Petition of the Institute is an omission. Why did they not commence with the objection—"Here is a Building Act which does not define a building," one of the most absurd omissions that could be imagined in the Act of 1894, and which the present Bill does not propose to supply. One is really surprised that an architectural body should not have taken this opportunity of calling attention to such a manifest omission in the definitions prefixed to the 1894 Act, and which are to be accepted in the new Bill, which does not provide any "definitions."

The Petition, however, assumes that it is impossible to deal with details in recording the objections to the Bill, and goes on to classify the portions of the Bill to which objection is taken. The real case against the Bill is set out very well in the first portion of Clause 13 of the Petition:—

"13. Your Petitioners strongly object not only to the form of the Bill but to the manner of inserting by way of amendments to the existing Act additions deletions changes and new powers and provisions many of which are of such importance and so drastic and far-reaching in their effect as to render it not only expedient but necessary that they should be dealt with as specific and complete enactments. The method of setting out the new proposals in the Bill adopted by the Council makes it difficult to easily appreciate the meaning and probable effect thereof without continual reference to the Act of 1894. This in a measure dealing with the building laws applicable to so extensive and thickly populated an area is most objectionable and prejudicial to the interests affected thereby. Your Petitioners submit that the proper course would have been for the Council to repeal the existing Acts to consolidate and re-enact their provisions with such modifications as may be necessary and in this way to combine in one measure a complete and intelligible building code."

With all which we entirely agree; the remainder of the clause goes on to elaborate the same argument, but we need not quote it further. The Petition then proceeds (Clause 14) to express dissatisfaction with the part of the Bill dealing with the formation and widening of streets, maintaining that many of the restrictions contained under this heading "are not required in the public interest," and "will prevent the natural and advantageous development of property in and the reasonable architectural development of the Metropolis." It would have made matters clearer if the Petition had indicated some at least of the provisions which they consider will have this unfortunate effect. As it is, we can only look through this portion of the Bill and endeavour to gather what it is that is objected to. But it is difficult to form any opinion as to this. Is it the substitution of 50 ft. for 40 ft. as the minimum width of streets? or is it the provision that the raising of a building which has been lawfully built "within the prescribed distance" should be regarded as a new building? If it is the 50 ft. street that is objected to, it is not creditable to the Institute to have raised an objection to what is really an enlightened move in the right direction: The majority of London streets are too narrow, whether considered from the architectural or the hygienic point of view, and we are glad to see any promise of a legislation which will lay the foundation of a wider street system. If it is the provision that raising the height of a building shall be considered as making a new building, that may no doubt be a grievance to the building-owners, but it is an advantage to the general public, and would give the Council a power of control in regard to heights of street buildings which is very much wanted. In either case we fail to see what is the injury to the Institute of Architects.

In its Clause 15, relating to the legislation on lines of Building Frontage, the Petition objects to the powers to deal with private rights conferred on the Council by this portion of the Bill. But unless they have such powers, how are they to form and to regulate the lines of new streets? The Petition states that the terms of compensation provided are "of a confiscatory character." We fail to understand the meaning of this charge, unless it refers to the provision (xxxi., 7 *c.*) that the compensation is not to be affected by any improvement or alteration made in the property after the notice of intention to claim it has been advertised in the manner legally provided, if such alteration or improvement "was not reasonably necessary and was made or created with a view to obtaining or increasing compensation under this section." We presume this is what the framers of the Petition consider to be "confiscatory." We should say it was a blow struck at a very vicious system of gambling with property, the money made by building speculators on this system coming, of course, ultimately out of the pockets of the rate-payers, in other words, the public. The provision is in the public interest; and in any case, what it has to do with the interests of the Institute of Architects, unless they wish to pose as a body of land and property jobbers instead of artists, we fail to see. The only one of the proposed clauses that seems to us decidedly questionable is xxxii., 4, which provides that the Council may take any part of a house, building, or manufactory that they may require without being compelled to take the whole. This might in some cases lead to injustice to individual owners; it might be condoned by a special compensation, no doubt, but it is a rather drastic clause, and if there were any chance of the Bill becoming law, should be reconsidered.

The most astonishing thing in the Institute Petition is the second part of its Clause 16, of which we may say that we could hardly believe our eyes when we read it. It runs as follows:—

"The restriction now proposed by Clause 58 of the Bill that buildings should not be raised to a greater height than the width between houses on both sides of the street in which the building is to be erected is unfair and will seriously interfere with and retard the reasonable development of property in the older portion of London and will in many cases enormously reduce the value of the property affected and without adequate compensation."

A provision that houses should not exceed in height the width of the street is what all who take an enlightened view of either architectural effect or healthful conditions in cities have long recommended and desired; here is at last a proposal to carry it out, and the leading body of architects, instead of congratulating the London County Council on so wise an enactment, is the first to condemn it, on the mere grounds of what may be called the exploiting of property. Individual owners will be prevented from carrying their buildings as high as they want to and making as much money as they want out of a site; that is to be the first consideration, and the architectural effect of London and the public health are to be put second to it; and it is the Institute of Architects which promulgates this view! We can hardly believe that some of those whose names appear as formal signatories to the Petition have realised what they are signing; probably the Petition has been drawn up by a Committee which has been specially appointed for that purpose, and certain members of Council have had the duty of signing it; but we can only say that a clause such as that we have just quoted is not creditable to the Institute, and might better have been expected from a corporate body of auctioneers or estate agents than of architects.

The criticism (Clause 17 of the Petition) that the portions of the Bill dealing with "Construction of Buildings" contain a number of minor alterations for which no necessity can be shown and which "would cause great inconvenience in administering the Act" does not appear to us to be justified. We see nothing unreasonable in any of the proposed requirements; and as to "inconvenience," of course designing a structure in accordance with a number of legal requirements is always, in a sense, an inconvenience, but it is one which is inseparable from the proper regulation of buildings in cities.

With the Petition of the District Surveyors' Association against the Bill we feel more in sympathy. They have some reasonable grounds of complaint. They also object strongly in the first instance to the form of the Bill, expressing

their opinion that "the method of setting out the new proposals in the Bill makes it difficult to appreciate the meaning and effect thereof without continual reference to the Act of 1894." That of course is what is intended; but, as already observed, it is a most inconvenient manner of legislating. The most important clause in the District Surveyors' Petition is as follows:—

"9. Your Petitioners also object to the additional powers being conferred upon the Council under Part XIII. (Superintending Architect and District Surveyors) Clauses 127 and 128 provide in certain events for the appointment by the Council of any surveyor or surveyors for the purpose of exercising the functions of the District Surveyor and authorise them to require District Surveyors to perform special services. Your Petitioners submit that it is and always has been the intention that District Surveyors should be competent and professional men of experience and independence able to undertake the responsibilities for which they have been specially trained and are fitted and that they should be free within limits to exercise a reasonable discretion in the discharge of their duties. In order to ensure this degree of competency in the persons appointed to perform the duties of District Surveyors the Act of 1894 requires that candidates for that office shall be qualified by examination and hold the certificate of competency of the Royal Institute of British Architects. Your Petitioners submit that the provisions contained in Part XIII. and other parts of the Bill will if sanctioned tend to greatly lower the status of District Surveyors whereas it is essential in the interests of the public that the independence of action by District Surveyors should be maintained and their position as statutory officers upheld."

This is we think a reasonable protest, by no means uncalled-for; and we also entirely sympathise with the Association in their objection to the power proposed to be given to the Council by resolution to change the statutory name or title of "District Surveyor." We can see no reason whatever for contemplating such a change, or for doing away with a well-understood title which has acquired an honourable signification. The District Surveyors of London, as a body, have done their work admirably, and are entitled to the confidence and support of the public; and the proposals relative to them in the Bill are hardly what they had a right to expect. We do not, however, concur in their protest against the suggested institution of salaries in place of payment by fees. In our opinion payment by salary is the more suitable system; and the present arrangement of payment by fees, in other words "payment by results," though we do not say that it has led to any abuses, is apt to make people think that it may do so, which is undesirable from every point of view.

As we have said, we think the form of the Bill fatal to it, and that on that account it cannot possibly pass into law. But we do not think it is open to much serious criticism as to its proposed effect, and the opposition it has encountered can hardly be said to have been inspired by regard for public interests, which are what such a Bill is rightly concerned with.

HOUSE OF COMMONS.—Mr. C. J. Williams, clerk of the works, has carried out some improvements at the House of Commons by removing the reporters' gallery refreshment buffet to the topmost floor of the clock-tower wing, where it is now level with the reporters' dining-room, over the members' entrance. The alteration will give more space in the ladies' gallery corridor, which affords access to three of the writing-rooms, and the general catering is henceforth to be conducted at a counter between the principal smoking-room and the dining-room.

NOTES.

The Thames Barrage Scheme.

AS IT stands the Thames Barrage Bill proposes the constitution of a Port Commission having power to construct a barrage at Gravesend if such a work should appear to be desirable. The permissive character of the suggested authority is no drawback, and as a body representing those whose interests are centred in the Thames it would have ample scope for useful work. But it is by no means improbable that the new body might decline in the end to carry out the scheme which is the real objective of the present Bill. The dock companies do not appear to look upon the measure with favour, and, as they have much to gain by its realisation if the scheme be good, and much to lose if it be bad, their views clearly deserve attention. Foremost among the objections raised on their behalf is the loss of motive power now supplied by tidal action. Steamship owners might not be seriously inconvenienced by alteration of the existing conditions, but the proprietors of sailing barges, which constitute two-fifths of the vessels passing Gravesend, might have something to say, and it seems to us that the barrage would most likely have the effect of increasing the cost of various supplies and particularly of cement coming from the lower reaches of the river and from the Medway. As to the adequacy of the locks for dealing with traffic there are reasonable grounds for apprehension. Even granting the possibility of dealing with existing traffic by distributing it over the twenty-four hours, the promotors of the project have to show that ample accommodation can be afforded for extensions of business in years to come. These points are quite apart from purely engineering problems, which, as we have before said, are difficult of solution and upon which no precedent exists for guidance. London is not a fit subject for experimental work unless successful results can be confidently anticipated.

Specifications.

EXPERIENCE in the United States seems to agree very closely with our own as to the lax manner in which specifications are frequently drawn. The writer of an article in an American contemporary says that, when anything out of the ordinary course is to be contracted for in architectural or engineering work, most specifications are such that intending contractors are often obliged to ask for supplementary information, and not infrequently to obtain necessary data by visiting the site of the proposed works. It ought to be perfectly easy for a designer to say what he wants in clear and simple language, and to express all his requirements under properly classified headings. Unfortunately, the task appears to be one of the most difficult falling to the lot of the architect and the engineer. It may be that principals themselves are not incompetent, but leave too much to their assistants, and in that case the obvious moral is that an important branch of education is being overlooked by technical colleges and schools. Apart from this aspect of the question, our experience is that much of the confusion existing in the average specification results from the attempt to save trouble by using some old and not altogether applicable specification as a basis for the new document to be written. The designer should remember that the more trouble he gives to contracting firms, the higher is the price his client will have to pay. This reflection ought to make clear the point that the skilful writing of a specification is a most important part of his duty.

Damage to Roads.

AN interesting point was recently raised in the case of The Kent County Council *v.* Corporation of Folkestone, which was an action brought by the Council, as the road authority, to recover damages or expenses from the Corporation for extraordinary traffic on the highways. The defendants were widening one of the roads in their jurisdiction and the damage to the road was caused by the hauling of stone by means of traction engines to the place where the work was being carried out. The work was commenced in December, 1902, and was completed some time after the action was brought. The stone was hauled under a contract made with a contractor, commencing in April, 1902, and the work under this contract was completed in March, 1903. The action was commenced in February, 1904. The question which came before the Court of Appeal for decision was whether the action had been commenced within the time prescribed by certain statutes. The defendants had set up the Public Authorities Protection Act, 1893, which only allows actions to be commenced against public authorities "within six months next after the act, neglect, or default, complained of"; but under the Locomotives Act, 1898, there are special provisions regulating the time within which proceedings must be taken to recover expenses and damages—"twelve months of the time at which the damage has been done or when the damage is the consequence of any particular building contract or work extending over a long period not later than six months after the completion of the contract or work." The Court of Appeal decided that this latter Act does not overrule the earlier statute of 1893; but, unfortunately, the Court was not called upon to give any decision showing how the two statutes are to be reconciled, for they held that the Public Authorities Protection Act, 1893, had no application to the facts of this case, since the contractor who did the damage was not a servant of the defendant corporation. In the result, the Court awarded damages 50*l.*, that being the amount of damage assessed to have occurred since the action was brought, and the decision is to the effect that the action must be brought under the Locomotives Act within twelve months, and that the latter words of the section only operate to extend that time when this period would operate oppressively. The section is a typical sample of recent legislation expressed in terms incomprehensible to the lay and legal mind alike.

The Electric Supply of London.

WE are glad to note that the London County Council and other municipal authorities are fully alive to the far-reaching consequences of the Electric Supply and Power Bills introduced into Parliament this session. One of the proposed power companies, which will have a capital of five millions, is to supply electric energy in Middlesex, Surrey, Essex, and Kent, as well as in the whole of the County of London. If the companies have their way, the supply of electric energy in London will be revolutionised. Several of them propose to sell energy at prices well under a penny a unit, and so the five and a half millions which have been invested by the Metropolitan Borough Councils in electric supply undertakings will be very seriously depreciated. In most cases, in the event of the local authority refusing permission to a company to supply a consumer, the company seeks to obtain the right of appeal to the Board of Trade to grant them permission. The Board of Trade would doubtless give them this permission if the existing undertakers were not able to supply on reasonable terms or within a reasonable time. As a general rule, also, the proposed undertakings are not to be subject to any power of purchase. In that case, the inevitable consequence will be the creation of a company which will have a practical monopoly of the electric lighting of London. The proposed limiting of the maximum dividend to 8 per cent. is no cure for the evils arising from a private monopoly affecting so many interests. The matter is urgent, as we are convinced that the supply of electricity in bulk is both feasible and profitable. What electrical engineers call the "diversity factor" of this kind of supply is very high, since the energy can be supplied for many purposes, and so on a suitable site it can be generated very economically. Not only are the municipal supply undertakings in the metropolis threatened by the proposed legislation, but also many of the supply companies. It has been suggested that the London County Council should be the authority for supplying electricity in bulk to London. We think that the existing companies would do well to arrive at some arrangement satisfactory to the Council whereby consumers can have a supply of electricity on the most economical basis.

Overhead Tramway Wires.

THE case of Neale *v.* East Ham Urban District Council, recently tried before Mr. Justice Ridley and a special jury, raises a question of some importance to the public. The plaintiff was an outside passenger on one of the defendant's tramways; the tramways are worked by an overhead trolley wire, and electricity is conveyed to the tram by an arm with a wheel running on the trolley wire. The wire snapped and a portion of it struck the plaintiff on the head, and his cap was burnt by the electric current, and he sustained a severe electric shock, and was otherwise injured. The plaintiff contended that the mere happening of such an accident was evidence of negligence on the part of the defendants, and, in addition, alleged that a covering should have been supplied to provide for the safety of the passengers. The defendants' case was that the wire was the best that could be procured, and that it was tested before it was put up, and examined once a week, and that the flaw could not have been discovered, and in the result the jury found for the defendants. In view, however, of the number of accidents that have occurred in connexion with this system of electric tramways the question to be tried seems rather a wider one than whether the defendants have exerted due care in the working of the system, and to resolve itself into whether such a system should be adopted at all. The Tramway Companies are compelled to provide for the safety of their passengers, but they are even under a greater obligation to numbers of the public using the streets, and should be compelled to use the system which assures the greatest safety to both classes of the public.

London Street Traffic.

IN rapid succession, one after another of the omnibus companies and other owners have decided upon the adoption of mechanically-propelled vehicles, until there now seems a probability that in a very short time the horse will be abolished for drawing public conveyances of the class indicated. This development has raised the hopes of those who believe that mechanical traction will become universal in the streets of the metropolis at no distant date, and enthusiastic supporters of automobilism are already discussing new types of road pavement suitable for the anticipated reform. Perhaps it may be useful to consider improved forms of paving in about twenty years hence, when we shall better be able to form an opinion as to how far any radical change in road construction may be practicable. In the meantime, however, motor omnibuses threaten the tramway system with competition of the most formidable character, the effects of which will probably be felt by ratepayers before very long. The new development demands consideration by the Royal Commission on London Traffic, and should be taken seriously into account by the County Council before any further expenditure is sanctioned on tramway extensions.

Disused Burial Grounds: London.

SOME recent building operations at Islington go to show that the Postmaster-General does not consider himself to be bound by the provisions of the Disused Burial Grounds Act of 1884 and the Open Spaces Act of 1887. A leading champion in the defence of such open spaces was, and, we believe, still is, legal adviser to the Post-Office, and it is true that the prohibition against building for other than church-extension upon land which comes within the purview of the statutes is not in express terms rendered applicable to the Crown. It seems, then, that the Post-Office authorities in erecting some premises upon a disused burial-ground in Church-street, near Islington-green, have not broken the letter of the law. Nevertheless their action indicates that, under existing conditions, the burial-grounds of London, which are gradually being acquired and protected at a great cost and under considerable difficulties, are not absolutely safe from intrusion or appropriation.

Old Worcester.

THE City Council of Worcester propose to secure for purposes of a public recreation-ground the site of the Fort Royal, which was constructed in the time of the Parliamentary War, and presents many vestiges of its earthworks and circumvallation. The Council are also minded to acquire the buildings of the adjacent hospital, known as the "Commandery," which Bishop Wulstan founded at Sidbury, in the south-east parts of the city, *temp.* William II., for poor brethren. Cardinal Wolsey appropriated the foundation, with others of the same kind, for his two colleges at Ipswich and Oxford; Henry VIII. bestowed it upon Christ Church. The existing buildings comprise the large XVth century hall, which, albeit mutilated by a carriage-way at its west end, retains much of the carved work of its open hammer-beam roof. The upper apartments, fitted for the most part with oaken panelling, comprise the Prior's room from which is entered a small reading-loft that overlooks the refectory, King Charles I.'s bedroom, the Council Chamber, the Solar, or Lord's room, and in the roof, at the top of the staircase, a secret recess or loft—a hiding-place reputedly of King Charles II. An elaborately-carved chimney-piece in one of the rooms bears the arms per pale of Wilde and Berkeley. Thomas Wylde, clothier, leased the property from Christ Church, Oxon., and in 1577 a William Berkeley built the half-timbered house in New-street, which also is associated with Charles II. and the story of the battle of Worcester. After the fight on September 3, 1651, the wounded Duke of Hamilton died in the Commandery. Thirty-five years ago the buildings were converted into a college for the blind by the late Rev. R. H. Blair; the college migrated in 1887 to Powick in the suburbs, and they have since been occupied by a firm of printers.

The Fine Art Society.

AT the Fine Art Society's Gallery is a collection of water-colour drawings of "Clovelly and other places," by Mr. Hugh L. Norris, an artist whose name is new to us. These show admirable qualities in regard both to composition and colour, the latter especially. They are in the rather "washed-out" style, if we may so call it, which is affected by many of the younger school of water-colour painters, and in which the various elements of a landscape are treated as expanses of colour rather than as substances having special texture. This generally leads to a want of power in foregrounds, and in this case also a want of reality in the representation of sea, which comes into a good many of the views and is in almost every case the weak point of the picture. A mere wash of rather vague colour does not really represent sea; one only accepts it because, from the nature of the composition, it is obvious that it must be meant for the sea; apart from its position in the composition it would convey nothing. As long as the author keeps on land

however, his work is always interesting. The view of "Clovelly from the Hobby Woods" (18) is a beautiful piece of colour. No. 31 shows nearly the same composition under a different and colder light. Among others that we specially liked are "The Hay Cart" (2); "The Avon from Sandyballs Wood" (10); "Willows" (11)—the character of the trees well given; "Looking over Clovelly Park" (41); "The Avon below Hale" (45); and "A Stretch of the Avon" (48). In the Clovelly views the artist has got the poetry of the place, if not all its picturesqueness in detail.

The Grafton Gallery.

THE exhibition of the works of the French Impressionists at the Grafton Gallery is succeeded by an exhibition representing work the most opposite artistic character—that of the oil paintings, with a few bits of sculpture, by Mr. Emil Fuchs. The paintings are mostly portraits, highly finished but in a hard and matter-of-fact style (those of men especially) with which we have little sympathy. The painting called "A Hasty Impression" (42) is more attractive as a work of art than the finished paintings, as it shows freedom of line and breadth of style. Of the larger and highly-finished works the most effective are the portrait of Miss Kaufman (3) in a red dress, and that of Madame Sager (4), which has dignity and an expressive head. Dignity is not wanting in the others, but the style is dry and mechanical. Among the sculptures is a pretty bas-relief, "In the Spirit of Olden Times" (15), a Madonna and Child in fact, rather out of keeping with the prevalent style of the collection, and a portrait figure of Lady Victoria Grenfell.

Messrs. Dowdeswell's Gallery.

A SMALL exhibition of miniatures at Messrs. Dowdeswell's Gallery is made the occasion for the revival of a rather absurd fashion which once obtained, of painting a miniature of the eye of a person only, or, as in one or two instances here, the eyes of a whole family. Cosway is said to have set the fashion, having painted for the Prince Regent a miniature of the eye of Mrs. Fitzherbert, which he was to wear as an ornament. Some collections of eyes by Cosway and Engleheart are exhibited, and they are certainly beautiful examples of minute and careful execution; but the idea was hardly worth reviving. We can feel more interest in the complete miniature heads by Mr. Alyn Williams, some of which are very beautiful; we may particularly mention "The Viscountess Dupplin" (11), a *spirituel* head with a cloud background, and "A Study of a Child's Head" (14), also very expressive. All the miniatures by Mr. Williams are finely executed, and excellent examples of a fascinating branch of painting.

CANON LESTER MEMORIAL, LIVERPOOL.—Mr. George Frampton, R.A., has been commissioned to execute a statue of the late Canon Lester, which, when completed, will be placed on a site in St. John's Gardens, Liverpool. The statue, in bronze, will be 10 ft. high, and the stone pedestal 12 ft., giving a total height of 22 ft. The cost of the memorial will be 1,500*l*.

DINNER AND PRESENTATIONS TO MR. R. PHENÈ SPIERS.

A VERY interesting and indeed memorable gathering took place on Monday evening, when a dinner was given to Mr. R. Phenè Spiers, and an address and a number of gifts and memorials of different kinds presented to him, in testimony of the esteem felt by many for his abilities and his architectural knowledge and research, and also in recognition of the constant and willing assistance which he has during his whole life given to architectural students from all parts of the world.

The history of the inception of this movement on the part of his professional and other friends is sufficiently indicated in the speeches reported below, and space is wanting for us to say more here than how heartily we are in sympathy with the feelings which prompted this manifestation of regard. Mr. Spiers has all his life worked for the good of architecture and architectural education and not for reward; we are quite sure that he was the last person to expect a demonstration in his honour; it was totally unsought by him; and the occasion was a gratifying instance of the fact that work done in a spirit of thoroughness and for its own sake does not always, even in this world, fail of its appropriate reward, if not in money, in something which is more than money; for we are sure that in the enthusiastic recognition of Monday, and the memories of old kindnesses and old friendships which waked up again from far-off years, Mr. Spiers must have felt fully recompensed for his services in the cause of art and architecture.

The dinner was held on Monday at Pagani's Restaurant, Nos. 42-48, Great Portland-street, W. Sir Aston Webb presided, and there were also present:—

M. J. L. Pascal (Member of the Institute of France, representing the "Société Centrale des Architectes Français"), Mr. John Belcher, A.R.A. (President of the Royal Institute of British Architects), Sir John Taylor, K.C.B., Sir L. Alma Tadema, R.A., Sir William Emerson, Sir Henry Tanner, Sir Charles Holroyd (Keeper of the Tate Gallery), Mr. Walter Crane (President of the Arts and Crafts Society), Mr. Ernest Crofts, R.A. (Keeper of the Royal Academy), Mr. Fred Eaton (Secretary of the Royal Academy), and Messrs. Ernest George, Maurice B. Adams, Louis Ambler, W. Aumonier, R. S. Ayling, R. S. Balfour, Sidney H. Barnsley, Herbert Batsford, F. D. Bedford, H. P. Berlage (Amsterdam), W. H. Bidlake, Reginald T. Blomfield, A.R.A., A. C. Bossom, H. Branch, J. J. Burnet, A.R.S.A., W. D. Caröe, A. H. Christie, C. R. R. Clark, S. F. Clarkson, Douglas Cockerell, T. E. Collcutt, R. W. Collier, H. C. Corlette, H. O. Cresswell, T. G. Davidson, A. Davis, E. Guy Dawber, M. Duquesne, Alfred East, R.A., George Elkington, Frank Fox, George Frampton, R.A., J. Fulleylove, R.I., Theodore Fyfe, James Gandy, H. L. Goddard, W. Curtis Green, E. A. Gruning, Edwin T. Hall, T. Erat Harrison, George Harvey, Charles Henman, Gerald Horsley, E. R. Hughes, A. R. Jemmett, W. Goscombe John, A.R.A., Professor W. R. Lethaby, W. G. B. Lewis, W. J. Locke, H. W. Lonsdale, Bertram Loud, R. Falconer MacDonald, C. E. Mallows, E. Margetson, F. W. Marks, H. P. G. Maule, E. J. May, Walter Millard, John Murray, William Murray, Ernest Newton, Philip Norman, Segar Owen, A. M. Paterson, James Paxton, M. G. Pechell, Graham Petrie, Professor Beresford Pite, E. E. Pither, F. L. Pither, Rowland Plumbe, W. T. Plume, A. N. Prentice, T. E. Pryce, T. M. Rickman, Lacy W. Ridge, C. E. Sayer, R. Weir Schultz, H. D. Searles-Wood, Professor F. M. Simpson, J. W. Simpson, Atherton Smith, Professor R. Elsey Smith, Stanley W. Smith, W. H. Seth Smith, G. T. Smith, Soloman J. Soloman, A.R.A., Frank Spiers, Walter Spiers, T. R. Spence, S. J. B. Stanton, Hugh Stannus, H. H. Statham, Leonard Stokes, J. van Straaten, jun. (Amsterdam), E. F. Strange, Arthur Stratton, C. J. Tait, H. Tanner, jun., Arnold S. Tayler, C. Harrison Townsend, F. W. Troup, Sidney Vacher, F. T. Verity, Emery Walker, E. P. Warren, A. M. Watson, T. H. Watson, Bernard H. Webb, T. B. Whinney, H. H. Wigglesworth, E. W. M. Wonnacott, W. Woodward, and A. B. Yeates.

After dinner, the toast of "The King" having been honoured,

The Chairman briefly asked the company to drink to the health of their honoured guest, Richard Phenè Spiers.

Mr. Spiers, in reply, said that as he was to address them fully later on, he would do no more than express his gratitude to them for that extraordinary assembly, and the delight it gave him to see a much greater number of his friends than he had ever seen together in a single room.

This part of the proceedings then terminated.

While the tables were being cleared and re-arranged for the presentations, Mr. Spiers held an informal reception of his friends. The various gifts were then brought in by a procession of Old Students of Mr. Spiers, and the presentations were made by the Chairman, and by M. J. L. Pascal (on behalf of the "Société Centrale des Architectes Français" and of the "Atelier Blouet-Gilbert-Questel-Pascal, Paris).

Mr. R. W. Schultz first read a number of letters and telegrams expressing the regret of some of Mr. Spiers' friends who were unable to be present.

Professor Aitchison wrote:—"Will you be kind enough to make my excuses on the ground stated [doctor's orders], and to say that I think we are greatly indebted to Mr. Spiers for investigating the methods of teaching in the various Continental schools, and thus enabling the Royal Academy to open a school which did not exist when I was a student. It has not only been the means of improving the work of those blessed with architectural invention, but has also brought to the notice of the Academy men possessed of this gift that was quite unsuspected when they first entered."

Professor Capper wrote:—"I need not say how warmly I sympathise with the gathering; if opportunity offer, please convey an expression of this hearty sympathy, coupled with loyal good wishes of every kind to the teacher to whom so many of us gratefully look, unknown to him, in our work of teaching, day by day."

Professor Ware (Massachusetts) wrote:—"Ever since I first met him in 1866, when he had just returned from Paris, and I was in London, getting hints about architectural education, he has been a constant friend and helper, both to myself and to my students, and it is a great satisfaction to know that his services are to receive this recognition."

Mr. Frank Miles Day, New York, wrote:—"When a student in London more than twenty years ago, Mr. Spiers was most helpful to me by his advice, and, if I am not mistaken, influenced my career considerably by what he said to me. It gives me the greatest pleasure, therefore, to enclose the vellum slip for attachment to the memorial. . . . You will be glad to learn unofficially through me that, at the recent convention of the American Institute of Architects, the Board of Directors recommended Mr. Spiers for honorary membership, not only on account of his scholarly attainments, and the contributions he has made to architectural education in England, but because of the wise counsel and friendly assistance which he has so often given to American students of architecture while in London."

Mr. Gibson, of New York, wrote:—"I am glad to learn that an address is to be presented to Mr. R. Phenè Spiers; and I consider it a privilege to be included among those who will sign it. I regret very much that the length of the journey and the demands of business will prevent my coming to London to be present at the dinner. Nothing would give me greater pleasure, and I hope that you will transmit to Mr. Spiers my sincere and cordial greeting, and the assurance that I continually remember not only his able and kindly and tactful tuition when I was one of his students at the Royal Academy, but I have also the liveliest appreciation of the fact that it is partly due to his advice and information that I came to America, where I found opportunities which could not have been expected at home. No doubt Mr. Spiers will recollect me even among his hundreds of friends, and to think that he will is a great pleasure to me."

Mr. Schultz said that the list represented not only Englishmen, Scotsmen, and Irishmen, but gentlemen of all nationalities. This little movement had received the heartiest sympathy from all parts. They had received letters from the Colonies, India, America, Spain, Italy, France, Holland—from almost every European country, and also from several Japanese students who had come under Mr. Spiers' influence. Amongst those who had written or telegraphed were Professor Aitchison, Professor Capper (of Victoria University, Manchester), Professor Lanteri, Professor Baldwin Brown, Professor W. R. Ware (of Massachusetts), Professor Miles Day (Vice-President of the American Institute of Architects), Dr. Cuypers and Jan Stuyt (Amsterdam), and Messrs. R. Norman Shaw, A. T. Bolton, Walter Cave, H. D. Davis, E. M. Gibbs (Sheffield), Sir Thomas Drew (Dublin), R. W. Gibson (New York), J. A. Gotch (Kettering), W. Banks Gwyther (Calcutta), T. G. Jackson, T. Rogers Kitsell, J. A. Morris, F. Masey (Cape Town), S. Hurst Seager (Christchurch, New Zealand), Kotaro Sakurai (Japan), W. A. Pite, J. J. Stevenson, T. Worthington (Manchester), Allan Vigers, and many others. Mr. Schultz then brought forward the illuminated address to Mr. Spiers, the first page of which we publish among our illustrations this week. He said it contained over 300 signatures of British architects, five of architects in India, twenty-four from the Colonies, fifteen from the

United States, three from France (in addition to an address sent by the Société Centrale des Architectes Français), four from Japan, and a number of others. Mr. Schultz concluded by reading the address.

Professor Pite then presented a large medallion portrait of Mr. Spiers, which had been modelled by Professor Lanteri; an illustration of it is given here. He said he had the honour to present the medallion which they had subscribed to their dear friend Phenè Spiers. Professor Lanteri had expressed the pleasure he had had in having sittings from Mr. Spiers, and he was prevented by illness alone from being present that night.

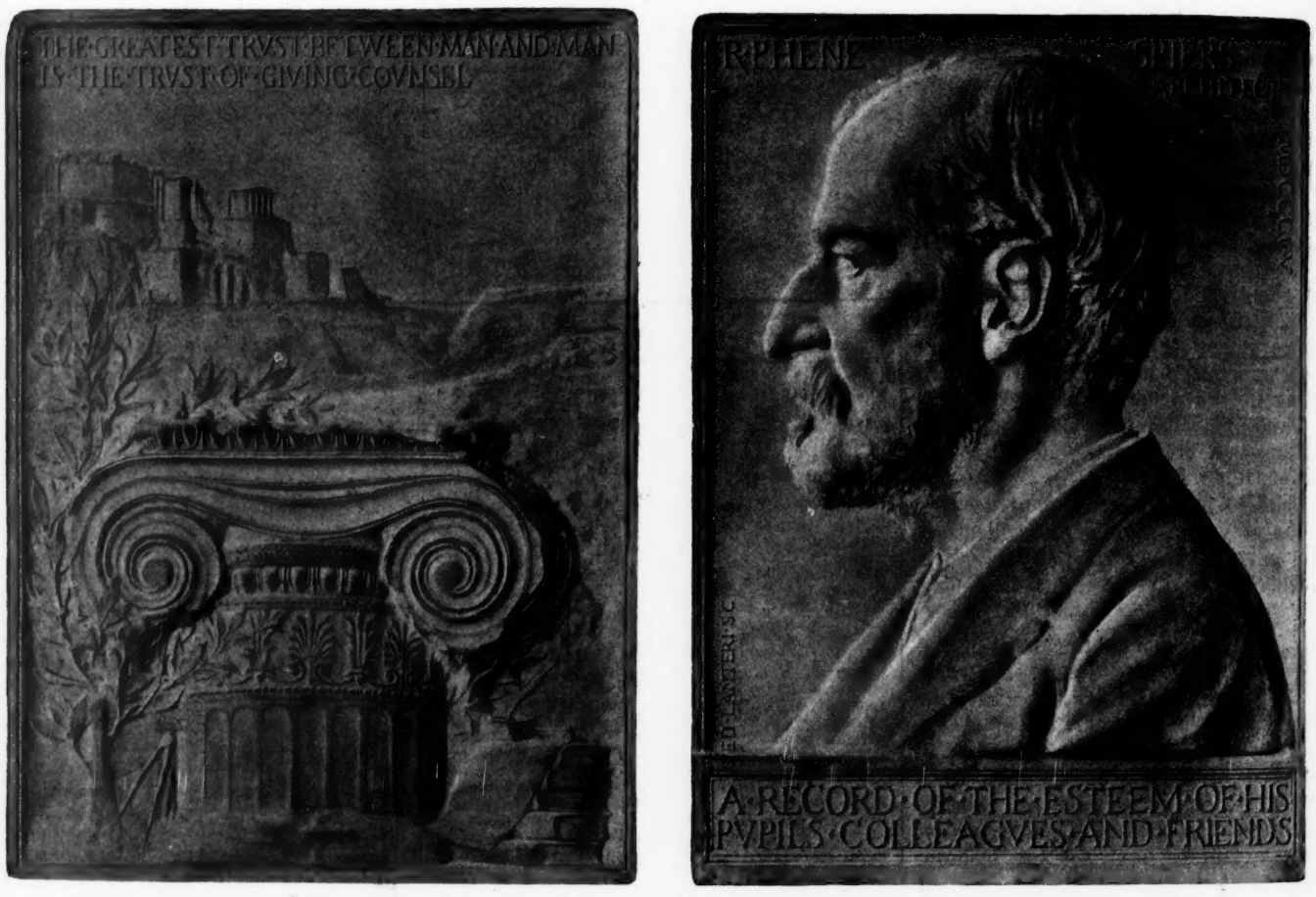
Mr. E. Guy Dawber, President of the Architectural Association, next presented a small medallion portrait of Mr. Spiers.

Professor Lethaby followed with a volume of the collected essays by Mr. Spiers. He said he had great pleasure in offering, on behalf of the Committee, a copy of Mr. Spiers' essays, which had been got together under great pressure and difficulty in a very short time by Messrs. B. T. Batsford.

insisting on that subject, and, the field being clear, he could celebrate the services he had rendered to his (M. Pascal's) compatriots at such times as they needed information, help, or personal attention while in England. "That is why I remit you the commemorative medal struck in your honour by the Central Society of French Architects, to which you belong as corresponding member. Aside from signifying the gratitude for the cordial, efficient, and active relations which you have had with this Society, it honours with its respect the man, the distinguished artist, the zealous archæologist, and the earnest teacher who placed before the practical and productive career the ideal disinterestedness of the professor and theorist. The signatures here grouped promiscuously on a sheet of paper are far from representing all those which might have been obtained. . . . The old friends of the Atelier Questel in which you studied at the Ecole des Beaux Arts of Paris, an atelier reaching back more than fifty-five years in the same old house, with four successive professors—'Blouet, Gilbert, Questel, and your old comIn the midst of the praises which ought to be recounted, since we are here only to celebrate your affability, your devotion for the young, your varied and necessary labour, your knowledge, your fraternal feeling, and all that occasion this banquet, I was the only one who could bring, with the south wind, echoes of your youth, the remembrance of student comrades, and this living proof that the cordial understanding of our two nations is not so new, since we practised it some half a century ago."

Mr. J. J. Burnet said it afforded him and his colleagues (Messrs. Sayer, Paterson, and Davis) great pleasure in representing the atelier of Questel, and they had much pleasure in handing their gifts to Mr. Spiers.

The Chairman said it only remained for him to ask their friend and guest to accept the various testimonials which had been laid before him as some small token of the esteem and friendship in which they held him, and in which they had always held him. The committee had tried to depart somewhat from the usual form of proceedings of this sort, because they thought that the occasion was somewhat an unusual one.



Medallion in Commemoration of the Presentation to Mr. R. Phenè Spiers. Modelled by Professor Lantéri.

The following books were then presented to Mr. Spiers by former Academy students, *i.e.*:—

Choisy: "L'Art de Bâtir chez les Romains."
Choisy: "L'Art de Bâtir chez les Byzantins."
De Vogüe: "Temple de Jerusalem."
De Vogüe: "Syrie Centrale, Architecture Civile et Religieuse."
Wood: "Ruins of Baalbek."
Coner: "Sixteenth Century Drawings of Roman Buildings."
Longfellow: "Cyclopædia of Architecture in Italy, Greece, and the Levant."
Jackson: "Dalmatia, the Quarnero, and Istria."
Butler: "Architecture of Northern Central Syria and the Djebel Haurân."
Schultz and Barnsley: "The Monastery of St. Luke of Stiris in Phocis and St Nicholas-in-the-Fields."
Jameson: "Works on Sacred Art," 6 vols.
De Caumont, Abécédaire on "Rudiments d'Archéologie."
Rhys: "Monograph on Lord Leighton."
Prior: "History of Gothic Art in England."
Murray: "Sculptures of the Parthenon."
Venturi: "Storia dell 'Arte Italiana."

The Chairman explained that the books were what Mr. Spiers had selected as representing those he would like to add to his library, and the books were being brought up by old students.

Another presentation was a laurel wreath.

M. Pascal then made the presentation of the Société Centrale des Architectes Français and the Atelier Blouet-Gilbert-Questel-Pascal, Paris. He said that the praises given to Mr. Spiers for his exemplary life relieved him from rade here present—offer you the first three volumes of 'L'Architecture Française de Blondel' published under the auspices of our Ministère des Beaux Arts; the fourth volume will soon follow. Amongst the honours which are conferred upon you, the one which will affect you most deeply, and certainly the most agreeable for me to transmit to you, is the recollection of our younger days. I am ignorant of what passing years have made of your gaiety, of your good humour, but I hope not to describe another man than the one which your pupils know when I recall the jolly companion you used to be. We owe to our continual association with youth more than it owes us. May the young men who surround me here have preserved you as we used to know you. We called you 'My lord,' because a custom—which I do not defend—demands that a nickname should replace the family name in the daily relations of our affectionate and practical joking French comradeship; and the term brought the air of dignity, of reserve, a little haughty, of the British subject in the midst of the spontaneity of his youthful gaiety into harmony with ours. You were a great worker; but with our young artists work does not go without some fun, and you were of too good company not to appear to put yourself in accord with us. When he had the honour last year of being President of the Institute he found that there was amongst the members a general desire to do something of this sort, and while he was arranging it he heard from Mr. Schultz, who said that others were also thinking of the same thing. He at once gave up his scheme as he felt a testimonial of this sort would be better disconnected from any institution, and Mr. Spiers might feel assured that it was the spontaneous wish of his brother architects of all shades of opinion to do him honour, and it must be a satisfaction to all that there should be such a representative body there that night for that purpose. The occasion was unique—partly on account of the international character it had assumed, as was shown by the signatures to the address—and partly because of the presence of M. Pascal, who had come from Paris on purpose, and who, unfortunately, was able to be here only a short time, and to whom they could not, therefore, offer their hospitality as they would like to do. He thought they would like him to express to M. Pascal the great homage they all paid to French art, and especially so when that art was the art of architecture, and was represented by so distinguished an architect as M. Pascal, and to assure him that his presence was greatly appreciated by them. There could

hardly be anyone there that night who could not record many kindnesses which they had received from Mr. Spiers. He would ask them to pardon him while he told them two of his own experiences. By some curious occurrence, shortly after he joined the Architectural Association in 1867, he was proposed as a secretary of the Class of Design. Some members of the class asked, quite rightly, why this should be, when Mr. Spiers, seeing an unknown man, spoke a word for him, and so he became secretary. Probably Mr. Spiers did not remember that, but he did and always would. He also remembered that when he had passed through his articles and was about to travel, he went to Mr. Spiers, as everybody did, and got from him information as to where to go and stay, and Mr. Spiers afforded him all the information that was necessary, and his information was of the greatest possible use. When he returned, and had started in practice, Mr. Spiers, who was competing for the Church of the Sacré Cœur at Montmartre, asked him to make the perspective of the church. That was a real kindness, for, though he could not do it as well as others, he supposed that Mr. Spiers saw he had nothing to do. The drawing was coloured by Mr. Haig, then an architectural draughtsman, and now the distinguished etcher. The drawings were sent in, but did not win the competition, and he often wondered whether that perspective had anything to do with the result, but it was a kindness of Mr. Spiers done just at the right time. He remembered those little gatherings at No. 21, Bernard-street, as they all did, where so many young men were met who afterwards became distinguished. Mr. Spiers's career was so well known that he did not propose to say much more. Mr. Spiers, as a student, won nearly all the prizes that were to be won—the gold medal of the Academy, the Soane Medallion Studentship; he was the first in the Class of Distinction of the Institute of Architects, he became President of the Architectural Association, and for many years he was a member of Council of the Institute. As an architect he was best known for his Board schools, Lord Monkswell's house, and general painter's studios. He was also a distinguished water-colour artist, and there was a beautiful water-colour of his in the Victoria and Albert Museum—the loggia of Hampton Court Palace, which always appeared to him to hold its own with the other drawings in the gallery. He had also produced much literary work of great merit and usefulness, as shown by his essays published by the Committee. Mr. Spiers was a member of a number of little coteries and societies—he (the speaker) belonged to one for twenty-five years; the members met at the houses of each other, where they made sketches, and Mr. Spiers was a valued member. Mr. Spiers also, as they all knew, had been Master of Architecture of the Royal Academy for thirty-five years, and there it is much of his most useful work has been done. He had said the occasion was unique, and what made it so was that there was no special reason why this time should have been chosen for a testimonial. A testimonial was often given to a man when he was about to resign, or receive an appointment, or was going away, but there was nothing of that in the case of Mr. Spiers. But there was one reason, and they all knew it—the one great reason was that they all knew that Mr. Spiers was a man who had devoted his life to the benefit of others rather than to the benefit of himself. In England we were usually enthusiastic about a man as soon as he was dead, but it was an extremely pleasing thing from time to time to meet together and honour a man while they were in the full vigour of life—to take a comrade by the hand and for a minute be able to say, while we rapidly pass down the stream: "Well and bravely done!" There was an old Italian proverb that "The best wheel in the cart does not make the most noise," and so the best work in the world did not make the most noise. Some had to lay foundation unseen while others gilded the summit of the dome before the world. A great deal of Mr. Spiers's work had been of the kind that was not much in the public eye, but he had laid the foundations of the careers of many young men who had grown up to feel their indebtedness and remember it, and that work would be more enduring than they perhaps had any idea. The work of preparing for that evening had been willingly and cheerfully performed by many—amongst them being Messrs. R. W. Schultz, W. R. Lethaby, J. J. Burnet, E. Lanteri, Theodore Fyfe, Allan Vigers, and G. Frampton—in order that we might meet here to-night to show our love, esteem, and respect for our guest of the evening, Richard Phenè Spiers.

Mr. Spiers, who was received with great enthusiasm, said what he had heard that evening had brought to his recollection events which he had entirely forgotten—events which had come in the ordinary work of life, and in itself had brought its own satisfaction. It was a great pleasure to him to see his old comrade M. Pascal, with whom he spent three years in the Ecole des Beaux-Arts. M. Pascal was his senior, and he had continual assistance and advice from him—and, in fact, from all in the Atelier. His education in architecture and his education in assisting one's comrades began in that Atelier. It was a great pleasure to him to see in *L'Architecture*, the organ of the Société Centrale des Architectes, a note expressing their desire, having heard of this event, to associate themselves with the memorial, and to send him an address with the signatures of the names of old friends in France. It had also been a great honour to receive the medal which the Société Centrale had given him; it was one of those beautiful medals for which the French artists were celebrated, and he had written expressing his gratitude to them for the honour and distinction. He also desired to express his gratitude to the students of his old Atelier for the magnificent reprint of Blondel's work. For the splendid gifts from his English friends, he expressed his great obligation and thanks to them all, and specially for the magnificent illuminated address, by his friend Mr. Allan Vigers, who had of late years developed other talents than those of architecture, and had become a well-known decorator, whose work in the Arts and Crafts Exhibition was marked by great vigour. On one side of it was his (the speaker's) portrait by his friend Sir C. Holroyd, who had kindly made it. He had also to express his obligation to Mr. Cockerell for the splendid cover in which the address was embodied, and to Professor Lanteri most especially for the medallion. This was one of the best ways of representing portraits, for one not only got character in such a work, but there was in addition always some sentiment in the reverse which was not found in the ordinary bust. The small medallion was also an admirable reproduction, having been specially cast for the Committee in Paris. For the printing of his essays he threw the whole responsibility on Professor Lethaby, for it was he who insisted that these essays should be reprinted, and had kindly written the preface. He (the speaker) had edited them, and through the subscribers' liberality he had been able to give additional illustrations, which explained better what he had to say. Mr. Fyfe had prepared an index to the volume at very short notice, and Mr. Cockerell was the binder of the volume. He was overwhelmed by the magnificent collection of books, and he did not know where he should put them all, and he was specially glad to have the work on Baalbek. He might relieve Sir Aston Webb by saying that the non-professional part of the jury in the competition for the Church of the Sacré Cœur at Montmartre wanted his (the speaker's) design because of the perspective. He had to thank the committee for the great amount of trouble and labour they must have had in organising that presentation, etc., and especially to his friend Mr. Schultz, and it was a great pleasure to see so many of his friends there. He hoped that his long record had given something to occasion such an event and such a gathering. He might also mention Mr. Burnet, whose career he had had something to do with, and he had been glad to hear Mr. Gibson's letter read and to know that he had to a certain extent laid the foundation of his career.

A musical entertainment, provided by Mr. Frampton, was then given, and the proceedings concluded at a late hour.

BAPTIST SUNDAY SCHOOLS, HILLSBOROUGH, SHEFFIELD.—The memorial-stones in connexion with new schools being erected by Hillsborough Baptist Church, Sheffield, were laid on the 23rd ult. The buildings are situate in Hawthorn-road, opposite the chapel, and will consist of an assembly hall and six classrooms, five of which can be thrown into the main hall by means of revolving shutters, thus providing accommodation for 600 persons. The entire cost is estimated at 1,450*l*. The joint architects are Messrs. F. W. Chapman and H. L. Paterson.

THE ARCHITECTURAL ASSOCIATION.

A FORTNIGHTLY meeting of the Architectural Association was held on Friday last week in the new premises, No. 18, Tufton-street, Westminster, S.W., Mr. E. Guy Dawber, President, in the chair.

The minutes were read and confirmed, and the following gentlemen were elected members—*i.e.*, Messrs. R. W. Burrows, Brixton; W. Bonser, Highgate; F. C. B. Dabbs, Clapham Common; J. A. Bessant, Regent's Park-road, N.W.; H. Bernton-Benjamin, Orchard-street, W.; and R. F. Atkinson, Sackville-street, W. It was announced that Mr. R. D. Warry had rejoined.

New Premises Fund.

The Chairman announced the following further donations to the Building Fund:—

	£	s.		£	s.
R. Moreland & Son, Ltd.	50	0	F. N. Rockitt ..	5	0
E. Guy Dawber ..	12	12	Leo Sunderland ..	5	0
J. Howard Colls ..	10	10	L. A. Turner ..	3	3
W. H. Lever (per B. T. Batsford)..	7	10	Needham Wilson..	2	2
Clement Jeakes & Co.	5	5	A. Huntly	2	2
A. W. Moore ..	5	5	F. C. Mears	2	2
Thos. Broad. Ltd.	5	0	F. Dare Clapham..	1	1
			Patman & Fotheringham	1	1

On the motion of Mr. Tanner, Hon. Secretary, a vote of thanks was accorded to Messrs. Lanchester and Rickards and to Mr. Delissa Joseph for kindly allowing members to visit the Deptford Town Hall and the South-East London Synagogue, respectively, on Saturday afternoon, February 11.

Mr. Louis Ambler, Hon. Secretary, announced a donation, of a model of a temple, by the Rev. W. J. Robbins, M.A., and on his motion a vote of thanks was accorded to the donor.

Country Houses and Accessory Buildings.

Mr. F. J. Osborne Smith then read the following paper:—

The invitation to prepare a paper upon this subject was accompanied by a suggestion that I should deal more particularly with the drainage of country houses and accessory buildings.

Approaching the subject from the point of view of an architect anxious to produce healthy dwellings for men and animals, it will be necessary to refer somewhat in detail to items of work which are not usually discussed in the studio or the drawing office, but too often left to be dealt with, more or less effectively, in the clerk of works' office, or, in the case of large buildings, by someone who has given special attention to them.

My aim is to induce students to give more attention to what many will find to be a very interesting portion of their manifold duties.

Architects should "design in beauty and build in truth," and there is no reason why the beauty of their design should be marred by truth taking the form of twisting pipes over the fronts and roofs of their buildings; careful arrangement in planning will obviate this by placing the sanitary fittings in such positions that their necessary pipes can be fixed practically out of view and yet be quite accessible in case of need. This is more easily effected in new buildings than in old ones, yet in the latter the unsightly lines referred to can usually be modified by judicious arrangement without in any way affecting the thoroughness and efficiency of the work.

"Sanitation," or "hygiene"—the science of promoting health—has, under the conditions of our civilisation, the first claim for consideration when designing a healthy dwelling, and it is not prudent for architects to despise or neglect this important branch of knowledge.

The most suitable position for our building to occupy on the site, the nature of the soil, the quality of materials, positions and dimensions of rooms, windows, doors and fireplaces, and the materials for roof, etc., all these affect the health of those who occupy the buildings, to say nothing of the limited portion of the subject which we are about to consider to-night, viz., the drains, water supply, and various fittings which are usually looked upon as sanitation.

Sanitary engineers have such an idea of the importance of their pipes that they will place them in the most conspicuous positions possible, utterly regardless of the elevation they are spoiling, while inside one hundred and one minor items will be inappropriately arranged so as to clash with decorative or constructional features, greatly to the annoyance and disgust of the architect.

Good plumbers are naturally proud of their

work, and do not like to have it hidden away, now, if we make use of this pride on their part and take an interest in their work, they will make a very creditable show, which can be made to harmonise with the surroundings and be too good to be covered up. If the architect shows that he appreciates and takes an interest in their individual work, it will encourage good artificers to execute it with special care, with the happiest results. This present craze for unduly hastening work, which only disheartens the workers, is responsible for much of the bad work frequently met with.

There is one other point I wish to call your attention to. Do not, as, I am sorry to say, many architects do, hand over drains and fittings to a merchant or manufacturer to carry out.

I propose now to refer to :—

1. Water supply and fittings required for the effective working of the water-carriage system of drainage.
2. Soil and waste pipes.
3. Drainage for soil and rain-water.
4. Land drains.
5. Stables, cowhouses, and dairies.
6. Disposal of sewage.

Water Supply, Cisterns, etc.

The source from which water is derived may be either collecting ground on moors, hills, etc., or artesian or deep wells, the latter being the most general. Great care must be exercised in selecting the wells which are to supply the drinking water.

There are country towns where the water is supplied by a water company to many houses, while the remaining are still supplied by wells, and it is no rare occurrence to find the disused wells of the former turned into cess-pools, with very serious results to wells of the latter; therefore, when further on we are considering our sewage problem, we must not forget the wells and the possible pollution that may result unless great care be exercised in selecting a suitable site for the disposal of the sewage. Note that the fall of the surface cannot always be taken as indicating the contour of the water-bearing strata.

Having satisfied ourselves upon the purity and quantity of the water supply, our next consideration must be how to store it in a convenient manner for use free from risk of pollution.

It may be stored in a reservoir or underground tank, which must be very carefully formed with sound brickwork upon a concrete bottom, and covered in by doming, arches, or concrete and iron ; the bottom should be formed with rounded angles to facilitate cleaning, and the whole of the inside surface rendered and smoothly trowelled in cement.

There should also be clay puddling round the outside and over the top, while the opening for access must stand well above ground to prevent surface-water finding an entry. Frequently the situation will not allow of this form of main storage tank, when it may be necessary to build a water tower and allow the water to supply the cisterns in the house, stables, laundry, etc., by gravitation or otherwise pump direct to the storage cisterns in the buildings, which frequently means very heavy work for the pumps due to long horizontal pipes.

Overflows, which should be as short as possible, must be provided to all tanks and cisterns, and not be connected to drains.

Store cisterns inside the building may be of lead, galvanised iron, or enamelled fireclay, and should always be provided with a movable cover and situated in a clean, accessible position.

Baths.

The bathroom should be large, light, and airy, with cross ventilation, and the walls and floors should be of impervious material, but if of wood it should be covered with lead.

The fittings may include, beside the usual slipper bath, a single or double lavatory basin, a shower and spray bath, either combined with the slipper bath or independent. Other baths are sometimes used, such as a sitz bath, bidet, etc., but the combined slipper and spray meets most requirements.

Perhaps the nearest attempt to an ideal bath is the latest pattern independent copper bath, which is made of strong copper with roll edge and strong supports or feet ; the outlet is at the end, where it should be, and not in the centre, as is usual in copper baths, and has large pillar cocks and standing accessible overflow, quick waste, and trap. At the end is a plate glass screen on three sides, behind which are the various plated pipes for shower, spray, wave, douche, etc. The next best is a first quality white enamelled cast-iron bath, with roll edge, quick, accessible waste and overflow combined, without casing, the outside being decorated in harmony with the room. Glazed fireclay is perhaps the most durable and sanitary material for baths, but, owing to its great thickness, a bath of this material is very heavy, and requires to be warmed with hot water when not in constant use. In public baths, where the demand for baths is constant, this kind is generally fixed. Some baths need enclosures ; these should be avoided, as the space within becomes a store for matter in the wrong place.

It is most important that a bath should be fitted with a plentiful supply of hot water, large supply valves discharging above the water line of the bath, and also with a large, quick waste. The noise frequently experienced when the bath is emptying may be checked to a great extent by providing ventilation to the waste pipe, although this retards the velocity of the discharge.

The lavatory basins may each be formed in one piece of pottery, or fixed beneath a marble top supported upon cantilevers, but without enclosures ; the necessary pipes may be of plated brass or copper if desired, but, personally, I prefer lead, kept back out of the way of injury.

While speaking of pipes, let me advocate the importance of fixing every pipe upon the surface of the walls, not buried in them, as is so often the case. Chases are sometimes advisable, but, if used, they should be regarded as recesses in the walls and be rendered in cement, or otherwise lined with impervious material to match the wall surfaces and covered with movable casing.

The hot-water service pipes may be carried along one side of the room or to a radiator, in the form of a towel horse, which will be found very convenient.

The linen cupboard might, with advantage, be formed somewhere near at hand, so that the hot-water pipes may, on their way to the bath, be used to keep the linen aired by passing through the cupboard.

Water-closets.

These should not be in the bathroom, nor should access to them be from a bathroom, but from a ventilated lobby common to both. Neither is it advisable to have a lavatory basin in the water-closet.

The walls and floors and ventilation described for bathrooms equally apply here. Carpets ought never to be used, a loose mat being far preferable. The apparatus should be as simple as is consistent with efficiency.

A pedestal closet should be of the wash-down type, not "wash out," in one piece of fireclay, or similar material, strong and neat in appearance, with accessible joints to soil pipe, and no recesses in which dirt may accumulate ; the flush pipe from the cistern should discharge vertically into a socket provided at the back, without india-rubber cone, and, with two gallons of water, should thoroughly wash the inside of the pan and replace the whole of the contents of the trap with clean water. The larger the water area, the less liable is the pan to become foul, but beyond a certain point the contents cannot be efficiently removed except by the syphonic action of the syphonic closet. There are various forms of this type of closet, some better than others. Those without air pipes and puff pipes in the cisterns, but having a second trap, are to be preferred ; the simpler the apparatus the better.

Various means for discharging flushing cisterns for wash-down closets have been devised. Besides the simple pull, there is the push valve, to release confined air and allow the syphon action to start, or to compress air and thus drive the water over the syphon to start it ; there is also the plunger, the lifting valve, lifting drum, etc. The lifting valve to start the syphon is the simplest and generally most certain in action, and is passed by most water companies.

The flushing cistern may be of cast iron, but should be galvanised to prevent rust ; lead-lined or cast-lead cisterns are best, when the water does not affect the lead, but are more costly. Porcelain is also a useful and ornamental material. The flush pipe of lead or copper should be as straight as possible, and securely connected to the arm of the pan. India-rubber cones are not desirable for this joint.

Valve closets are not so frequently used as formerly, owing to their complicated parts and liability to leaks, although they are sometimes preferred for ladies' use. They should be fixed within an enclosure, which is easily accessible, floor lined with lead, and the walls and all inside the enclosure painted white. There should be a large supply valve, accessible overflow, and a puff pipe to the open air from the valve box between the valve and the trap beneath. Slop tops, formed in one piece with the pan, assist in making a draught-proof seat.

Valve closets require a separate supply cistern containing about ten gallons.

Overflow pipes from cisterns and floors should *not* have flaps on their external end, as is so often advocated ; they invariably become set fast, either open or shut, and are then worse than useless. The small flushing cisterns can be cased or otherwise decorated to harmonise with the surroundings, and the pipes to and from them cased or plated.

Urinals.

In a private house "avoid them entirely"; at best they are a constant nuisance and need every care and attention, with abundant flushing ; even where necessary, as in clubs, factories, schools, etc., they should be as simple as possible, formed in one piece of fireclay, with waste and water-pipes easily accessible. The outlet usually supplied with them is almost useless.

Never fix urinals on upper floors, as, unless careful attention is given to the fixing and the waste from them, they invariably leak and cause trouble below. The weak points are naturally the joints, therefore the fewer the better, the one joint to which particular attention should be given being the one between the urinal and the trap, which should always be formed with a large brass washer, fly-nut, and union, having a dome grating with bayonet joint.

Housemaid's Sink, etc.

There should always be a small room, with opening window on each bedroom floor, accommodating a slop sink, which should be fitted with flushing cistern, etc., and connected to soil pipe, and also a sink for drawing hot and cold water. The waste from the latter should discharge into an iron (not lead) waste pipe. The combination of these two sinks in one set, so common in makers' catalogues and exhibitions, is often unsuitable for the intended purpose, because the hot and sometimes boiling water produces injurious expansion in the soil pipe with disastrous results.

The space under these sinks should be kept free from enclosures, and every facility given to minimise the difficulty of keeping these places clean. Above all things, linoleum should never be fixed under sinks, one so frequently finds it there with always the same result—moisture and decay.

The main water cistern should never be placed in this room, although, I regret to say, it is not unusual a position to find it.

Kitchen and Scullery Sinks, etc.

This department should have preferably a north aspect, lofty, well-lighted by windows reaching to near the ceiling. The walls and floors should be of impervious material, which may be readily cleaned. The sinks should consist of one or more for washing purposes, and may be of enamelled fireclay, with wire or teak grid ; tinned copper or lead-lined wood sinks, each having their respective merits and defects. Fireclay sinks are cleaner than the others, but are easily damaged by saucepans, and are liable to break the crockery unless the grids are used. Copper and white metal sinks are perhaps the best, but are expensive. While lead-lined are very general, they are dirty, and frequently need repair, but are less destructive to crockery. Vegetable sinks should also be provided for washing vegetables, and are best of the deep enamelled fireclay kind, fitted with perforated shield grating and standing overflow and waste combined ; being much more easily cleaned than others.

All sinks should be supported upon cantilevers, and the spaces under should not be enclosed, although a guard rail will be necessary to protect the pipes and traps from injury.

Teak sinks are sometimes used for washing-up purposes, but they need constant cleaning to remove grease, etc.

Outlets from sinks should always be formed with large cobweb gratings. The trap below should be connected to the sink by a strong brass union, back-nut, and lead washer, instead of the spiggot and socket with stoneware pipe

so frequently met with in the cheaper class of sink.

Larders

should have a northern aspect, with abundant cross ventilation, and be near the kitchen, but not entered direct from it. Wire gauze (preferably of copper) should be fitted to the windows and secured to wood frames on hinges. Some larders are fitted with pickling troughs, with plug and waste; these, of course, must not be connected to a drain, neither should a gully be in the floor. If drainage from the floor is necessary, it should be formed by currenting the floor to an outlet through the wall as short as possible and discharging upon the surface of the paving outside.

Shelves should be of slate, supported upon cantilevers, the walls lined with white glaze bricks or tiles, and the floor of some impervious material. Personally, I prefer a slate table in the centre of the room, leaving the walls free. Larders should not be formed underground.

Pantry and Stillroom.

The butler's and footmen's pantries and the stillroom require sinks, which may be either of enamelled fireclay or lead lined; some butlers prefer the former, others the latter. These sinks are usually supplied with draining boards, preferably of beech, and not covered with lead. The space under the sinks is usually enclosed; when this is the case the walls and wooden sides should be painted with white enamel and a lead safe formed on the floor, turned up all round at least 6 in., having a 1-in. waste pipe discharging through wall to the open air. This cupboard is generally used for a pail to receive pieces, tea-leaves, etc., and soon becomes in an unsanitary condition if precautions be not taken to ensure cleanliness.

Enclosures under or around any sanitary fitting invariably become nuisances, and it is preferable, except in special instances, to omit them and everything that hinders the regular cleaning of the recesses. All these sinks should have drinking water laid on from the main supply pipe and labelled "Drinking water."

Having considered so far how clean water can be obtained and utilised inside a dwelling, I now propose to indicate how foul liquids can be got rid of.

Soil Pipes.

When considering a soil pipe we must determine:—

1. The material of which it is to be made.
2. The size necessary under the conditions.
3. The position in which to fix it.
4. The surroundings such as rain-water pipes, etc., with which it should harmonise; and
5. Method of fixing and jointing the pipe.

Soil pipes are usually made of cast iron or drawn lead—cast iron made in 6-ft. lengths, either coated with Dr. Angus Smith's solution or galvanised; the latter is most suitable when the pipes are to be painted to match the rain-water pipes, because paint will not remain upon Dr. Angus Smith's solution. These pipes are cheaper than lead, less liable to damage, and more easily fixed and jointed, but they are more unsightly, and there is difficulty in obtaining a branch exactly to suit the position, and many branches mean many joints and much cutting of pipe. A cast-iron junction usually means at least three joints, while in lead pipe only one is necessary.

Drawn lead soil pipe is made of thicknesses corresponding with those of sheet lead. The pipe whose thickness is equal to that of 8 lb. sheet lead is the strength most generally used, or for special purposes 10 lb. The inside surface of lead pipe is smooth, and, provided that the size is suitably small for the work, it will remain clean and free from corrosion.

Rarely will it be necessary to exceed 3½ in. internal diameter for any soil pipe, especially in country houses. Lofty buildings in towns may require 4 in., while larger sizes are occasionally met with. I might mention that these larger pipes are almost invariably furred to a considerable thickness on the inside after being in use a long time, thereby reducing their internal diameter. I know of one case where the working diameter of a 4-in. pipe was thus reduced to 2½ in. A ventilating pipe is quite a different matter; 4 in. to 6 in. diameter may be often more suitable than 3½ in.

If it be necessary to fix the soil pipe within a building, it should be of 8 lb. drawn lead at least, but must not be buried in the wall, and if in a chase, the walls should be treated as previously described for water pipes and the casing in short lengths should be secured with brass cups and screws to framed grounds fixed to the walls. The most suitable place to fix a soil pipe is *outside* the building, in which case it should be arranged in such a manner as to be as unobtrusive as possible. The method usually adopted of fixing soil pipes in 10-ft. lengths with three pairs of double cast-lead tacks is certainly efficient, but at the same time it is not elegant. Sometimes astragal joints or socket joints are used instead of the usual wiped joint, with disastrous results, there being insufficient solder to form a lasting connexion, more especially if it be fixed with sheet lead tacks fixed 6 ft. apart. How can this be remedied?

One way I have found very successful is to have strong pipe in, say, 6-ft. lengths, to agree with the rain-water pipes, which may also be of lead, and fixed to walls with extra strong lead strips wiped on to the pipe at the joint and covered with ordinary sheet lead ears, the joints being "wiped" in the usual way, with a small astragal attached to the pipe above and below the joint. By this means the pipe is securely jointed and fixed, and, except to the initiated, is similar in appearance to the rain-water pipes. We are told that an "anti-siphonage pipe" is necessary to preserve the seal of the closet trap. Quite so; but in the majority of country houses anti-siphonage pipes are not necessary, there being only two principal floors as a rule. Perhaps in one or two instances it might be necessary, but need not occur upon the principal elevations in a carefully-planned building.

Soil pipes now invariably discharge direct into the drain, and the upper part is continued to above the roof of the same to greater diameter, with a simple open end protected by a stout copper-wire balloon. Cowls have been proved by experiment and practice to have few, if any, advantages over open ends, as these pipes frequently act as inlets as well as outlets, the less obstruction there is to check the current of air in either direction the better.

Boiling water must be carefully excluded from lead soil pipes, otherwise the undue expansion will split or tear apart the lead at the junctions between the branches and the main pipe.

Waste Pipes

from baths, lavatories, sinks, etc., not being slop sinks, should always discharge into gullys in the open air *beneath* the grating, but *above* the water. This is a very important point, as many by-laws require them to discharge into a channel 2 ft. from the gully. A more objectional arrangement it is difficult to imagine, and I hope before long to see the provincial authorities follow the example of the L.C.C. and eliminate this undesirable by-law.

These waste pipes must be, if more than a few feet in length, of some material which is not easily damaged by hot water. Wrought iron with screwed joint or cast iron with caulked joints are most generally in use, although the short lengths referred to previously and short branches may be, and in fact are, preferably of lead. The expansion of iron pipe, if connected directly to a lavatory basin, etc., is very likely to damage the fitting.

Lead pipes have, I might almost say, an ideal internal surface for conducting water and sewage from point to point, offering the minimum of resistance. They are, however, injuriously affected by various means—for instance, damage by violence, such as knocks, nails, screws, etc., when behind panelling or casings; chemical action when buried in walls producing decomposition; "creeping," buckling, and, finally, cracking or tearing when subject to great variation of temperature. The facility of bending lead pipes of small diameter is so great that its use is often preferred for this quality alone, which enables the pipe to be fitted with greater ease to the angles and curves.

Wrought-iron pipes are expensive and more liable to rust than cast-iron, which is cheaper and stronger and allows a little play at the joints. The joints will probably in course of time need recaulking if the stack is very long and has very hot water frequently passing through it.

There is another type of pipe which is referred to in one of the latest books upon this subject as the best for all purposes—viz., cast-iron pipe lined with lead—what better would be desired—a strong exterior, with a smooth interior, of lengths corresponding with rain-water pipes, and the joints more easily made and fixed than in the case of lead pipes. Let us for a moment consider the condition of this ideal pipe after it has been in use as a waste pipe for a short period. Hot water has been frequently passing, and the lead lining has, in the same way as lead pipe, been expanding more than the iron outside, and consequently the two materials have become separated; the hot water still continues to flow intermittently through the pipe, the lead "creeps," and cannot bulge outwards because of the iron coating, therefore it is forced inwards, with the result that the pipe is practically choked. I will leave you to form your own opinion upon this ideal pipe.

Waste pipes generally may be considered similar to soil pipes as regards fixing, etc., but they must, as I said before, discharge into a gully near the foot, which in certain positions should have an air-tight cover and be ventilated at a convenient position away from windows, etc. The upper part should be carried above eaves and windows, and the traps of each fitting should be protected by a puff pipe, which is brought under the top of the fitting to the face of wall outside. This puff pipe does double duty—besides protecting the trap under the fitting, it acts as an overflow in case the vertical pipe is temporarily blocked, and thus saves a flood in the room below if a bath, for example, be discharged on an upper floor.

I always prefer waste pipes with junctions instead of the various branches discharging into heads at each floor. The heads offer a large exposed surface for the accumulation of filth.

The traps should be of strong anti-D cast-lead type, with screw cap for cleaning and a short length of lead connected to the iron pipe with brass tailpiece and caulked joint outside.

Traps from lavatory basins should be 1¼ in. diameter, while those from the bath and sinks, except scullery sink, should be 2 in. diameter, and the scullery sink 3½ in. to 2 in.—that is, 3½ in. at inlet, to receive a large cobweb grating.

Drains, Gullies, Chambers, etc.

The term "drains" is generally understood to refer to the pipes underground conveying the sewage from the soil pipes and gullies to the sewer, cesspool, or filter bed.

These are formed of two different materials—heavy cast iron, protected by a coating of Dr. Angus Smith's solution, and glazed stoneware The choice of these two is generally determined by the nature of the ground and surroundings and the relative positions of the house and drain. On a bad foundation, when passing under a building, or if the drains be near the surface, iron pipes, possessing greater strength and having fewer joints, are less liable to damage, but the inside is not so smooth, nor does it resist acids to the same extent that glazed stoneware does. A well-laid stoneware drain, with clear bore bedded upon and protected by good cement concrete with carefully-made cement joints, is much more self-cleansing than an iron drain. The cost of drainage is practically the same whichever kind of pipe is used, less concrete being required for the iron pipes.

Fall or inclination is an important factor in considering drains—1 in 30 (or 4 in. in 10 ft.) is most suitable for a 4-in. drain, and 1 in 40 (or 3 in. in 10 ft.) best for a 6-in. drain. We are not always able to obtain these falls, but they should be adhered to as closely as possible. Excess of fall is quite as unsatisfactory as too little.

Gullies.—All gullies should be bedded in cement concrete, fixed as near the surface of the ground as possible, and covered with a 3½-in. dished York stone to receive grating. When it is necessary to keep the gully low down, a chamber 12-in. square, inside dimension, should be formed of 9-in. brickwork in cement, smoothly rendered and brought up to receive the dished cover stone at surface of ground. It is essential that these extensions, and, in fact, the whole system, should be watertight. Deep chambers over gullies are not desirable.

Circular gullies (and square ones, by the use of an adapter) are sometimes brought to the surface with 9-in. diameter stoneware pipes, in which case the pipes should be surrounded with concrete. It is advisable to have all iron-work, except iron drain pipes, etc., galvanised, to protect it from rust. It is sometimes held that the galvanising soon perishes; I must say I have not experienced any inconvenience in this respect, while constant trouble exists where iron is not galvanised.

A flush tank, when connected to the scullery gully, is very useful for breaking up and driving

the grease through long drains. Sometimes the bath waste is arranged to effect this object. Sand used for cleaning copper utensils is a great trouble in drains, for when mixed with the grease it becomes very hard and solid. The only remedy is prompt and frequent removal of grease, etc., and by flushing with pails of hot soda-water or sweeping the drains, in addition to the flushing just mentioned. The gullies should be of the self-cleaning, deep-seal type, with 10-in. grating. Those used for surface drainage only should be of a deep pattern, to retain the grit, etc. When a waste pipe discharges some little distance from a gully it is often advisable to fix an access shoe at the foot and carry the drain to inlet of gully underground. This stoneware shoe should have a cover stone similar to those used for gullies, and galvanised iron plate let in instead of the grating, to keep out leaves, stones, etc. So-called grease traps are ineffective, as well as very offensive and dangerous contrivances.

Chambers—or manholes, as they are frequently called—should be placed at intervals in the drainage system, at bends, junctions, and at points of disconnection, also in straight runs of considerable length, at least over 60 ft., to facilitate sweeping, etc. The chambers should be formed upon a 6-in. bed of concrete, with 9-in. brick walls, smoothly rendered inside to underside of cover, the bottoms formed of white glazed channel with three-quarter channel branches, and brick on edge placed vertically along the main channel and benched up 6 in. vertically and back to wall at an angle of 30 degrees, to offer as little facility for lodgment in event of a temporary stoppage and also to give a secure foothold, which a steeper angle does not afford.

The portion not enclosed by the iron cover should have 3-in. York stone firmly bedded in cement. The size of these chambers depends upon their depth. A shallow chamber—that is, up to 2 ft. 6 in. deep—should be as nearly the size of the iron cover as is consistent with the number of branches it receives, while deeper ones should be about 2 ft. 6 in. wide and at least 3 ft. long, to give a man room to work in them. It is obviously unnecessary to form chambers larger than required for the work they have to do, because in case of a stoppage they take a longer time to fill, and make their condition apparent.

You will notice I have not advocated iron chambers even when iron drains are used. I think it will be a long time before we are able to find anything better than the chamber of rendered brickwork and white-glazed stoneware channels. Iron chambers are simply inspection bends or junctions; it is difficult to make the covers watertight, and they are not easy to open, especially when the object is to remove an obstruction. They are sometimes useful inside a building at the top end of a branch where the drain is shallow. These iron chambers still require the brick chamber, which should be rendered, and iron cover for access, so that there is no advantage in using them.

Chamber covers are of various types, those with a condensation seal being undoubtedly the best, especially when inside a building. There are also covers formed to receive tiles, wood blocks, and turf on gravel, which are less conspicuous than the chequered iron tops, only a rim of iron being visible. If necessary, any cover can be fixed just below paving level, the stone slabs bedded in sand effectively obscuring it from view.

Locking covers, except in certain exposed positions, are not necessary. Let each cover have eyelets for hooks, instead of hand holes, and be strong and heavy; they will then be too difficult for mischievous persons to open. Locks and bolts only become corroded, rusty, or broken, and are then useless, and cause considerable waste of time when examining or testing. Hinged covers are always a trouble, and are going out of use.

Ventilation of the system must not be forgotten. Soil pipes usually provide the necessary outlets, but they are not sufficient alone in all cases. The idea that two or more pipes taken from different branches to above the roof will secure efficient ventilation is erroneous. I will give you an example of this. A chamber was formed with five distinct branches, each with a V.P. taken above the roof. Surely this was sufficient ventilation. Yet, upon raising the cover after the drains had been used a few months, the air in the chamber was found most offensive. After consideration, I decided to form an inlet at ground level some little distance away, with the result that the chamber is now as wholesome as could be desired. At the same time, I do not like the inlet in the front area just outside the kitchen window, as is so frequently the case in towns; but in country houses there should be no difficulty in keeping the inlet at a reasonable distance from the buildings. I call these "inlets," but, at certain times, they undoubtedly act as "outlets."

Rain-water Drains.

When the rain-water drain is treated separately from the soil drainage there should not be gullies at the feet of rain-water pipes, but, instead, stoneware or iron access shoes with cover stone and plate, to prevent surface-water or other undesirable matter finding its way to the rain-water storage tanks. Otherwise the drains should be constructed similar to soil drains. They are usually 6 in. diameter with 4-in. branches to a single down pipe.

Rain-water Storage, etc.

Rain-water, especially when gathered in the country, is fairly clean, and, if filtered and stored in suitable receptacles, is a great acquisition, more particularly for washing purposes. It is best, whenever possible, to collect and store the rain-water as near the roof as practicable, thus saving expensive pumping machines and underground drains and tanks. Needless to say, a large overflow is essential to prevent flooding in time of heavy storms. Cisterns for storing rain-water above ground should be of galvanised wrought iron or lead lined, with covers in sections made to lift off. These cisterns should be placed in easily accessible and well-lighted positions.

When stored underground, the tank or reservoir should be similar to that previously described when considering water supply and storage, with the addition of a filtering chamber.

Purifying Rain-water.

There are two means generally adopted for removing many of the impurities, such as soot and roof washings, from rain-water. The separator, which allows the first portion of the water to run to waste and then, by a rocking motion, passes the remainder to the storage tanks is effective, but, of course, there is waste of water, which in a dry season is a consideration; while a filter composed of broken bricks, ballast, and sand is most useful, but needs occasional cleaning. Some favour a small settling chamber, divided from the filter by a brick wall built with half a dozen courses, dry at the bottom, giving upward filtration, thus avoiding to a great extent choking of the upper surface of the filter, as in the case of downward filtration. All the tanks must have an overflow, but this should not be connected to the soil drains. Some years ago, at a building which I now visit periodically, an underground rain-water tank had its overflow connected to the soil drains; during a temporary stoppage in the latter, sewage entered the tank through the overflow and was pumped up to the laundry. The overflow was diverted to a suitable position without any difficulty, and such a disaster cannot occur again.

For obvious reasons, surface-water gullies and gullies at the foot of rain-water pipes should never be connected to these tanks; yet I have seen soap-suds floating on the surface of the water in the rain-water tanks, probably due to foul water from a lavatory being discharged into a gully at the foot of a rain-water pipe.

Land Drains.

When the subsoil of the site is surcharged with water, it is advisable to conduct it away from the building as much as possible; this is accomplished by means of agricultural drain pipes laid with open joints a short distance apart in trenches, with ballast or brushwood to within a foot or so of the surface and covered with ordinary garden soil or mould. If there be a flow to underground, water and we are able by land drains to divert it from the site of the building, nothing more need trouble us except to see that the drains do not in course of time become blocked with roots, etc. The water is not always so easily disposed of. At best we may only be able to lower the level of the water, in which case we must maintain a free exit for the surplus and remove it as quickly as it accumulates, either by pumping or by discharging into a stream, ditch, or drain; in the last case it will be necessary to take precautions to prevent a back flow in case of flood or temporary stoppage of the drain.

A hinged flap is most frequently used, which closes upon a prepared seating and is fixed to the end of the discharge pipe; or a trap or gully in which a copper or rubber floating ball is placed, which, when water backs up into the outlet, effectively closes the inlet, thereby preventing the flood water finding its way into the land drains.

It is convenient to form chambers of brickwork in cement at intervals upon the land drains, to give access and ready means of inspection to see that they are working satisfactorily.

Rain-water or subsoil-water should be excluded from soil drains if the sewage is to be treated either by chemical or bacterial processes, otherwise unnecessary expense will be incurred by the increased volume to be dealt with.

Stables.

The floors of stables should be of hard, impervious material, with as few joints as possible, and currented to fall to a channel just outside the stall divisions, which discharges either through the wall into a gully or into an open end in the channel and thence to a gully outside. This open end is a small pit formed with a white glazed channel bottom and cement sides, and is made large enough to receive a galvanised cast-iron perforated bucket to catch straw, etc., and covered with a heavy hinged cast-iron grating. It is often desirable, however, to provide a shallow channel with a cast-iron cover, let in flush with the paving, and with similar branches to the centre of most of the stalls, to prevent the straw becoming wet. Loose boxes usually have the open end before described in the centre continued to the gully outside.

Every channel and drain in a stable must be easily accessible for cleansing and sweeping, and there should be no gullies inside the buildings.

The manure pit should have hard, impervious walls and floor, the latter currented to an outlet pipe discharging through the wall into a gully. These gullies should be self-cleansing, but must contain a galvanised perforated bucket to catch straw, etc.

Besides stalls and loose boxes for carriage horses, hunters, and cart horses, there is usually a sick box. This should be quite apart from the others and have a separate drain from it.

The washing space should have a deep yard gully to retain the grit from washings, etc.

If there be a shoeing forge, as is sometimes the case, do not forget to provide a drain from where the horses stand.

Drains from stables, cowyards, piggeries, etc., should always discharge into a liquid manure tank carefully built in brickwork in cement and rendered watertight, having a rounded bottom to facilitate removal of sediment. There should be a pipe from ground level to about 1 ft. 6 in. from the bottom, into which can be dropped the suction pipe of a pump attached to a manure cart. The liquid manure can then be carted to the fields or gardens where required. These underground storage tanks should also be provided with an access hole in their crown and an overflow to carry off an excess which may accumulate in time of storm from surface-water gullies, etc., and may be connected to the main drain from the house to the filter beds, etc.

An ample supply of water is important for the stables, but it should be distinct from the house supply.

A cistern in the loft or clock tower, to which the men can pump water, is a great convenience, and a hose can then be used for washing horses and carriages.

One or two sinks are necessary in the harness-room, or in a small room adjoining, with hot and cold water laid on to them.

If a suitable grate with a boiler be fitted in the harness or mess room, an ample supply of hot water can be provided for these sinks, which will be found very useful for various purposes

While speaking of hot water, I might remind you that the coach-house should be kept dry and at an even temperature. This is best arranged for by providing small hot-water apparatus with pipes from it to the coach-house, and, if possible, continued round the men's rooms.

Sometimes a loose box is fitted up as a Turkish bath for the horses. This can be heated by the same apparatus.

Cowhouses.

Each division in a cowhouse accommodates two cows, and a wide trough is formed just outside the heel post. This channel and the dunging passage should be formed of an impervious material with grooves to prevent the cows

slipping, and in the centre of each division should be an open end similar to those in the stables, and conducted to a gully outside. The space where the cows stand should be level, and formed of well-rammed chalk or clay. Calving boxes are treated like loose boxes, with an open end in centre discharging into a gully outside. Calf-pens usually have an open channel discharging over a gully. Pigsties should discharge through a pipe into a wide channel outside the sties, and be conducted to a gully with basket before entering the drain.

Dairies

should be in a cool, sheltered position within easy distance of the cowsheds and well ventilated. Near at hand should be the dairy scullery with sink, hot and cold water laid on, and paved floor currented to a pipe through the wall discharging on to a gully, *not* inside the building, as is frequently the case.

Disposal of Sewage.

The sewage when it arrives from the house and buildings may be treated in various ways, but time will not permit of a description of them all; they would provide more than sufficient material for a whole evening's discussion. One very simple and effective method which has proved quite satisfactory in dealing with this class of sewage may, however, be briefly described.

The sewage from a large country house with stabling for forty horses and accommodation for twenty cows, after leaving the disconnecting chamber, is first retained in a large watertight settling tank, covered over similar to the old-fashioned cesspool, except that the inlet and overflow are turned down, thereby, among other reasons, preventing the scum finding its way into the drains. This tank is capable of holding at least one day's flow of sewage. The overflow is discharged upon the surface of a long, open-air filter situated in a meadow, and composed of broken bricks, clinker, etc., finished with smaller local material on top. The sewage is distributed over the surface of the filter by channels or a sprayer and allowed to percolate through 4 ft. to 5 ft. of material, when it reaches a layer of land drain pipes at the bottom, which conduct the effluent to the end of the filter and thence to the land or ditch. The effluent is colourless and odourless.

The water in the ditch which receives it was foul and a nuisance before the introduction of this form of filter, but when I last saw it, after the filter had been in use about three years, it was quite sweet and wholesome.

The Chairman said he had an important committee meeting to attend elsewhere, and he would ask their Vice-President, Mr. J. S. Gibson, to take the chair for the remainder of the evening.

Mr. Arnold Mitchell, in proposing a vote of thanks to Mr. Osborne Smith for his practical paper, which was full of hints of all kinds which would help them in their work. It was the kind of paper they wished to have, and which they valued, but it dealt with things in a luxurious sort of way. Mr. Smith was a fortunate man. He had been giving hints on the planning and arranging of the buildings which they hoped to build, but he (the speaker) was afraid that very few of them would ever have the chance of building a Turkish bath for horses. Architects built stables, but Turkish baths for horses, while they might have them to erect, were not likely to come their way. Mr. Smith had in some measure been talking above their heads; he had been giving wrinkles about building which few of them would get to build; still, the information might be stored in one's mind for future use. The general tone of the paper allowed a luxury in the fittings and appointments of a house which, as a rule, the client would not allow the architect to indulge in. As to Mr. Smith's remarks that architects should endeavour to conceal the external drain-pipes, of course they should, but could they do it as a rule? Local authorities rightly compelled them to put soil and waste pipes outside the house. In a country house they did not expect to have courts and areas in which they could put their drainage arrangements as they could in London houses, and so leave the house fronts free. These pipes could not, as a rule, be kept away from the front. He was building a house in which there were many bathrooms adjoining the principal bedrooms, and adjoining these bathrooms there had to be closets. How could he avoid showing the pipes in such circumstances? It was Utopian to think of anything else; he would conceal them if he could, but it was not possible. Then, as to cross-ventilation being necessary or desirable, theoretically it was, but, again, in practice it was not possible. In a hospital they should get cross-ventilated lobbies, but in a house in the country it was not practical to get cross-ventilation to water-closets and to bathrooms. Mr. Smith suggested that the ideal bath was a copper one. That was so—if they could get it. Again, it was all a matter of expense. Copper baths were awkward things to handle. He had never found an independent copper bath such as Mr. Smith referred to which had a satisfactory rolled-over edge, but probably they were to be found. The value of a copper bath was its thinness—being thin, it took very little heat out of the water, and was an economical bath as far as the water was concerned, but, unless the material were thick, it did not resist wear and tear. Where a copper bath was used, a wooden casing was necessary, for a copper bath would not stand knocking about. As to the hot-water pipe to the bathroom, an economical way of using it was to run it round one or two sides of the room and bring it out about 4 in. from the wall on little brackets. That cost very little; it gave a certain amount of warmth to the bathroom, and provided the feature Mr. Smith spoke of as being achieved by the radiator—*i.e.*, it provided a towel-rail, but one on which the towels of all the family could be put. Water-closet pans were extremely difficult to keep clean with the two-gallon flush. He supposed that a large number of architects would agree that they had never found a pedestal closet that would keep properly clean with only a two-gallon flush. Most of the water companies would not allow more than a two-gallon flush, and he found that the way to keep it clean was to have it attended to every day by the housemaid. With a proper three-gallon flush this daily cleansing would probably be unnecessary, but with the ordinary pedestal flush-out closet and the two-gallon flush it must be cleaned as well. Therefore he thought valve closets were preferable, and there was no doubt that they were greatly preferred by most people, though the enclosure in front was objectionable. It was by far the most satisfactory closet to put into a country house, and the big water area and the comfortable seat were appreciated. If flushing cisterns were required they had best be of porcelain, such cisterns cost but little more than iron and were far sweeter. As to the kitchen floor, Mr. Smith said it should be impervious. Yes, theoretically; but what would the cook say? If the cook had to stand on a hard cement floor, or on any other hard substance, she would have something to say to her mistress on the subject. A wood-block floor was preferred by a cook, and though it was not impervious it enabled one to keep their cook a good deal longer. Standing on a wood block floor was not so tiring as standing on a hard cement floor. As to the support of sinks, he found that a good practice was to build them on little glazed brick piers but not enclosed. In regard to the material of scullery sinks, he thought porcelain was the best; there were more breakages, but makers were minimising that risk by the use of double wooden strips, which were screwed along the front edge, and when those strips wore out fresh ones could be put on. He thought that these wooden strips solved the difficulty to a great extent. Cleanliness counts for more than breakage, and more cleanliness was obtained from porcelain than from lead or copper. Mr. Smith spoke about 8-lb. and 10-lb. soil pipes. He (the speaker) had never used more than 7-lb. He could not afford more than 7-lb. pipes, but he would not put sockets 6 ft. apart; he put them 5 ft. apart. He found that 5 ft. spacing was about the limit for rainwater pipes, and also for soil pipes where both were of lead. As to country houses having iron drains, while iron drains were put in London buildings where they run under the floors, it was a new experience to him to put iron drains in country houses. He should have thought the cost was considerably more than in the case of earthenware pipes, and he thought iron pipes were unnecessary. According to the by-laws of many local authorities cement had to be put under the drains, and the requirements would not be abated if iron pipes were put in. The requirements stated that the drains must be on a bed of concrete, and if iron drains were used the authorities would not let less cement be used, they would have concrete right along the drain, and so cost would not be saved. [Mr. Smith: The authorities, I believe, ask for concrete at each joint of a pipe outside a building]. As to the fall of a drain, what Mr. Smith said was news to him; he had always allowed the usual fall of 2 in. in 10 ft. A deeper fall added to the cost of the excavation. He tried to keep pipes as small as possible, and in country houses he doubted if they need be more than 4 in., though he saw that Mr. Smith said 6 in.

Mr. S. Flint Clarkson said that, to his personal knowledge, Mr. Smith had not merely a tepid regard for gulleys, quick wastes and wiped joints, but an ardent love of them. His paper might have been more aptly entitled, "Notes as to the Sanitation of Country Houses and Accessory Buildings," but apparently both the larger title and the limited scope of the paper were suggested when Mr. Smith was invited to prepare it; perhaps he would deal at large at a future time with the branches of the subject indicated, but not treated in detail. Mr. Clarkson then made suggestions as to the provision of sanitary blocks in large houses, reached by cross-ventilated (but warmed) lobbies, containing cistern chambers at top, and water-closets, some bathrooms, lavatories, etc., below. If in a generally accepted position, say on the north side of the building, and near the principal staircase, they would be readily found when looked for, and awkward windows, suggestive pipes and ventilators on the garden fronts of pleasant buildings would be avoided. In a well-arranged water-closet the seat should not be under the window, but against a piece of unoccupied wall, draughts and trouble in water supply being thus avoided, and the soil pipes, if there was a cross-ventilated lobby, that is, a lobby with open spaces on each side of it, could be in accessible (but not prominent) positions on the outsides of the walls. Mr. Clarkson then touched briefly on some of the details referred to by Mr. Smith. 1. For hot-water supply have a cylinder adjoining the kitchen range with short (but large) flow and return pipes and a stand pipe, serving as supply to fittings, carried up from the crown of the cylinder. 2. For pantry and still-room sinks use framed sinks of teak. They are easily kept clean, are not injured by hot, or any, water, and no metal linings are necessary to make them water-tight; a very ordinary washtub is watertight. 3. Cregeen's trays, Duckett's channels, Albion slippers, and other contrivances have useful ends. It is well to keep waste pipes from fittings well away from waterless traps of gulleys when the traps of fittings are also dry. Such appliances must, of course, be kept clean, but no appliances (water-closets, sinks, gulleys, traps or trays) should be allowed to simply take care of themselves for any length of time. 4. Mr. Clarkson noticed the use of varied spelling and various plurals for gulley, and suggested the uniform use by architects of "gulley" and "gulleys." Wandering words should be fixed without undue delay, and with deliberate determination. 5. As to inspection pits—a term to be always used, "manhole" being dropped as conveying awkward impressions—there should not be undue anxiety to reduce their lengths. Easy bends should not be made awkward by little shortenings of the pits; the use of a valve to open a special outlet from the ground level when the ordinary outlet was choked was advocated. 6. Underground tanks for rainwater should generally be preferred to cisterns inside buildings, which make architects the slaves of their roofs. Especially in a building of good extent freedom from such petty cares was worth a good deal, and was not worthless in other cases. An underground tank was cool, and could be easily supplied and readily cleaned. The overflow, if no filtering chamber was provided, should be from a sump at the bottom of the tank, a pipe being carried under the bottom and up the side to the level of the top of the dome. This pipe should lead the overflowing water into rubble drains in touch with a fair area of permeable sub-soil; connexions with foul drains being wholly avoided. 7. Flues in walls, lined, it may be, with pipes grouted all round, and otherwise carefully arranged might frequently be substituted with advantage for pipes as air inlets and outlets from drainage. A great show of recognisable sanitary pipes on the exterior of a comely building seems barbarous. A strong effort should be made to obtain public approval of unostentatious flues well arranged and suitably terminated. 8. Mr. Smith had spoken evil of flap caps to overflow

pipes, but they might surely be improved, not given up; make them well, and keep them well tested and cleaned. Mr. Clarkson stated that a too Gargantuan appetite was not pretty to see, so he would stop abruptly at this point. Mr. Smith, a young and capable architect, was to be congratulated on his past and his future. He had composed a paper which gave the results of much patient study and much experience of good practical work.

The Chairman, in putting the vote of thanks to the meeting, said he was glad to hear that the drains of a country house did not govern the design, and that it was still possible to make the design govern the laying of the drains. He had had to deal with experts of various kinds, and had almost got to feel that there was little latitude left an architect in regard to architectural design when it was a question of drainage. The paper was full of hard facts, and would open their eyes to the relative value of the fittings of a building, and would no doubt widen their experience of these things. Architects, in the hurry of their work, had hardly time to look round and keep pace with the numberless new developments in all branches of the building trade, which went to make a complex modern building, and they were indebted to Mr. Smith for bringing so much useful information together. He was old enough to remember the great battle of big *v.* small soil pipes—when Mr. Norman Shaw startled the sanitary world by advocating 2½-in. diameter soil pipes and 3-in. diameter drains. He had not the slightest doubt that, as far as the general practice of sanitary science went, Mr. Shaw was right, and Mr. Shaw was the first, he believed, to carry into practice the use of the small soil pipe and the small drain, and small pipes had since proved to be much more efficient servants than large ones. He remembered having to redrain a comparatively small country house, of about ten or twelve bedrooms and stabling for three or four horses, a few years ago, and he was astonished to find that the main drain pipe was 9 in. in diameter—big enough to drain a village. He thought they might accept the hints given in the paper, and carry them out as far as they were consistent with a client's views, for, after all, an architect might have his own idea of what was best and most advantageous, but a client rightly had a good deal to say on the subject. There were many ideas in the paper which were new to him, because he did not have much to do with erecting country houses. He would like to get country work in the summer time, but at this season he preferred the London drawing office to the country. What had been said by Mr. Smith as to sanitary fittings for country houses applied to all types of houses. As to bathrooms, he wondered whether it was most desirable to get the bath up close against the wall or against two walls and in a corner. As a rule, the bathroom was so small that it could not be got in the middle of the floor, as was done in hospitals, although he knew a man who sacrificed a good deal of room in order to get a bathroom in which he could do this. The objection to placing baths in the corner was the dirt which got under and around the bath, and he had been trying to get an ordinary iron bath, without any feet, made so that the bottom will stand in the ordinary way but set in a cradle, with the casing carried right down to the floor and prevent dirt getting below. As to water-closet fittings, the use of siphonic fittings was becoming greater every day. People found that the noise and inefficiency of the ordinary closet were, except in the case of very cheap work, against its use, and the various types of siphonic closet were proving a good deal more satisfactory. For flats, and where families lived, he thought they were essential. As to manholes and small extensions to gullies, he thought cement was one of the worst materials to use in the way Mr. Smith mentioned. It was not impervious to moisture; on the contrary, it was exceedingly porous. He thought manholes and extensions to gullies could be built at comparatively small increased cost by second quality white glazed bricks or ordinary brown glazed bricks. He had always done that, even in cheap buildings, and the cleanness and efficiency were well worth the cost. As to what Mr. Smith said about supplies of water to stables in a country house being kept distinct from the house supplies, he did not think Mr. Smith could mean one supply for the house and another, quite distinct, for the stables. No doubt Mr. Smith meant that there should be a disconnexion between the two—just as, in practice, he never connected stable and house drains together; they were distinct in the way that no sewer gas could travel from one to the other. As to Mr. Clarkson's remarks about providing for outlet and inlet ventilation of drains by means of flues in the walls, the suggestion was an admirable one if it could be carried out, but he, for one, had never been able to do it except to a very limited extent. There was no reason why these things should not be treated architecturally, except that it was exceedingly difficult to do so. The inlet to drains to buildings he had often built in the walls with an ordinary outlet flap—that was, inlets which came to within a foot or two above the level of the ground and up to 5ft. or 6ft. above the level. But when they dealt with height in piping he could not see how it was possible to do that except at great expense.

The vote of thanks having been heartily agreed to,

In replying, Mr. Osborne Smith said that many points had been raised, that replies would mainly consist of repeating what had already been stated in the paper. He desired to point out to Mr. Mitchell that the paper was dealing with country houses, and not small suburban residences; in the latter, 7-lb. soil pipes and 9-in. walls might be considered sufficient for a certain class of client. The various suggestions made in the paper were compiled from long and varied every-day experience, and should not be "above the head" of any architect who knew anything of this important subject. A few points might be emphasised; as, for instance, ventilated lobbies were not necessarily *cross* ventilated, as was supposed by Mr. Mitchell; independent copper-baths with roll edge were much in demand now; pottery cisterns were about 17 per cent. more than cast iron; piers under scullery sinks were filthy and insanitary; lead soil pipes were usually fixed every 3 ft.; 4-in. soil drains from the house were ample, 6-in. for storm water; channels from waste pipes to gulleys are always foul; flues in brick walls to serve as ventilating pipes would be very unsatisfactory for the health of the inmates; finely-trowelled cement was far superior to glazed bricks for chambers and gulley tops, because of the numerous joints in the latter; the supply of water could be common for house and stables, but the store cisterns should be separate and distinct. He also went on to say that he was an architect speaking to architects and students, not a sanitary expert, except in so far as all architects should be sanitary experts if they were to design healthy dwellings.

The Chairman announced that the next meeting will be held on March 10, when Mr. H. V. Lanchester will read a paper on "Law Courts."

The meeting then terminated.

BRITISH SCHOOL AT ROME.

THE second open meeting of the British School at Rome for the present season was held on February 21, and was well attended by Italian and foreign archæologists and by members of the British colony in Rome. The Director, Mr. H. Stuart Jones, read a paper on the circular reliefs which, among other sculptures of earlier date, were employed for the embellishment of the Arch of Constantine. They fall, according to the original arrangement, which has not been adhered to, into four pairs, one relief representing an emperor hunting (or, in one case, starting for the chase) and the other a sacrificial scene at the shrine of a deity, who differs in each case. Professor Petersen, following the opinion which has been current since the middle of the XVIIth century, considers that the reliefs in their original state belong to the time of Trajan, and, as he stated at the conclusion of the paper, is not prepared as yet to modify his views. Mr. Stuart Jones maintains that upon the south side, where alone the original features of the imperial figure are preserved, in no case can it be proved that Trajan is represented, and that, though the heads are very much damaged, the characteristics which can be recognised in the best preserved of them are rather those of a Flavian emperor. Upon the north side the case is different. Here all the heads have been altered in antiquity; but whereas in the two hunting scenes we have a head of Constantine, the original head having been roughly broken off and the new head fitted with surprising care to the fracture, we find that in the two scenes of sacrifice the emperor is not the same, but is probably to be identified wth Claudius Gothicus. It is known that immediately after the death of Maximianus Constantine proclaimed himself the grandson of the deified Claudius Gothicus, while from the style of the heads it is impossible that any emperor before the time of Alexander Severus can be represented. It is to be noted that these heads are the original ones carefully worked over, one of them having been accidentally broken off and replaced. The same working over is to be seen in one of a pair of reliefs in the Villa Medici, where a representative of the same emperor has been introduced. They represent a procession before the temple of the Magna Mater and of Mars Ultor respectively, and, Mr. Stuart Jones thinks, belong to the Flavian period (the theory that they belonged to the Ara Pacis Augustæ has had to be abandoned, as since the discovery of new fragments in the recent excavations there is no room left for them). Inasmuch as Claudius Gothicus was proclaimed emperor in the first of the two temples, and is known to have restored the mausoleum of the Flavian gens, while we have no other record of any building activity on his part, it is not improbable that the reliefs originally formed a part of this edifice. The significance of the arrangement of the reliefs on the arch consists in this—that on the south side we have the unrestored reliefs representing the original Flavii, while on the north we see the new Flavian dynasty (for Constantine himself was a Flavius) all marked by the nimbus.

Mr. A. J. B. Wace, student of the School, followed with a paper upon certain as yet unnoticed reliefs in the Vatican and the Lateran, which, according to the results of his investigations, fill the gap which exists in our knowledge of the development of Roman reliefs between the date of the Arch of Titus (81 A.D.) and that of Trajan at Beneventum (115 A.D.). The first of these is a relief which presents an almost exact duplicate of part of the relief of the Arch of Titus representing the procession bearing the table of the shewbread, and may belong to the Arch of Vespasian and Titus erected at the entrance of the Circus Maximus. Next comes a group of fragments of a slightly later style, which seem to come not from a procession but from a group, showing an important tansition of style, the completion of which is seen on the arch at Beneventum. The third represents a portion of a triumphal procession, which probably comes from some unknown arch of Domitian.

TRADE CATALOGUES.

THE Lawrence Water Softener and Steriliser Company send us a descriptive catalogue relative to their process of softening and purifying water. The underlying principle is well known, and is applied in the Lawrence apparatus by boiling the water, so as to liberate carbonic acid gas from the unstable bicarbonates of calcium and magnesium and to deposit the insoluble carbonates left. Boiling is effected continuously, the entering water passing through pipes which abstract heat from water leaving the apparatus. Thus the water passing through the apparatus is gradually heated up to the boiling point and afterwards cooled, so that it is finally discharged very little warmer than when it entered. For the treatment of permanent hardness, caused by the presence of sulphates of calcium or magnesium, it is necessary to employ carbonate of sodium as a reagent for the deposition of the calcium in the form of carbonate. The Lawrence apparatus is made in all sizes, from those suitable for domestic use, in which heat is supplied by a Bunsen burner or any convenient source, to installations for public water supplies when heat is furnished by steam. The system has the advantages of being cleanly and of requiring very little attention.

We have received an interesting catalogue, entitled, "Notes on Electric Lifts," from Messrs. Archibald Smith & Stevens, Queen's-road, Battersea. Tables are given showing the comparative cost of working hydraulic and electric lifts, and the scientific and engineering data given can be checked easily by anyone having an elementary knowledge of electric and mechanical units. The first half of the catalogue gives useful general information, and the latter portion describes the class of machinery made by the firm. We note that lift motors can now be supplied which will work satisfactorily from ordinary alternating current supply mains, and the results published of commercial tests on these machines show that they are perfectly suitable for this kind of work.

We can recommend anyone interested in lifts to get this catalogue.

The Diesel Engine Company send us their catalogue of the Diesel oil engine, constructed for use with liquid fuel, and working upon a new—but now well-known—principle giving the high fuel efficiency of 41 per cent. Unlike ordinary oil and gas engines, this machine is not an explosion engine, and the temperature necessary for ignition is obtained solely by the compression of atmospheric air. When the required temperature has been attained in the cylinder by this means, the fuel is sprayed in with a suitable admixture of air at such rate that the temperature and pressure remain practically constant during combustion. Apart from the question of economy, this motor is particularly worth the attention of architects, as the absence of a flame, hot tube, or electric spark igniter, obviates all fire risks. For a similar reason the suitability of oil with a high flash-point is an equally desirable feature. The catalogue illustrates engines in sizes ranging from 40 horse-power to 160 horse-power, and includes detailed particulars relative to the various standard sizes manufactured.

Messrs. Hartley & Sugden, of Halifax, send us their catalogue of boilers, radiators, and other heating apparatus. This is a book of 120 pages, containing particulars and numerous illustrations of independent hot-water boilers, hot-water boilers for brickwork setting, low-pressure steam boilers, radiators and fittings, hot-water pipes and valves, riveted high-pressure steam boilers, steam heaters and hot-water cylinders, steam-jacketed pans and ovens, range boilers, furnace pans, boiler fronts, and sundry fittings. From this summary it will be seen that the range of the apparatus made by this firm covers nearly all that is necessary in connexion with heating and hot-water systems.

The Novelty Rack Co. send us their catalogue of umbrella and hat stands; the umbrella stands are on the turnstile rack system, which is now well known, in which the handle of an umbrella or stick is held by a revolving clip. The special point in the hat stands is the use of their "new hook," of considerable projection, whereby it is possible to hang up or take down an overcoat from the coat-hook without knocking down the hat.

Messrs. Alex. Boyd & Son have sent us a leaflet describing their "New Double Hot-water Tank System" for domestic hot-water supplies. It is intended for use with hard waters, which are such a constant source of trouble when the single tank system is used. The general principle is not novel, and there is nothing to show for what particular feature a patent is claimed. The tank is double, that is to say, there is a larger tank in which a smaller tank is enclosed. The larger or primary hot tank is fed from a small cistern controlled by a ball-valve, and so placed that the primary hot tank is never quite full. A vent-pipe is taken from the top of this hot tank to any convenient point. Flow and return pipes are fitted between the boiler and the primary hot tank in the usual way, and complete the primary circulation system. The water in this system is not laid on to the ordinary draw-off cocks, and the small loss due to evaporation is automatically replenished from the small feed-cistern. The amount of calcareous or other deposit in the boiler is therefore only the small quantity precipitated by the first charge of water and by the dribbles required to make good the losses by evaporation. The water in the secondary system is entirely disconnected from that in the primary. A feed-pipe is brought down from the main storage cistern and connected to the inner or secondary hot tank in the usual way, and from the top of this hot tank an expansion-pipe is carried up to a point above the cistern, also in the usual way. The branches to the draw-off cocks are taken from the expansion-pipe. It is a defect in the diagram that the main branch is not continued back to the hot tank to form a circulation. The water in the inner secondary tank is heated by the contact of its sides with the hot water in the outer primary tank. The arrangement more usually adopted in systems of this kind is to have the primary tank (or coil, for a coil of pipes is often used) inside the secondary tank instead of *vice-versâ*, and we are inclined to think that this is the better arrangement, because deposits may and probably will occur in the secondary tank, and if this is inside the other, as shown in Messrs. Boyd & Son's diagram, the deposits cannot easily be removed. It is erroneous to say that, because the water in the secondary system "never reaches boiling-point . . . no lime is deposited." Water, very highly impregnated with lime, etc., may part with some of its salts even at normal temperatures, as witness the formation of stalactites and stalagmites in caves. The double tank or cylinder system does, however, undoubtedly reduce the troubles arising from the use of hard waters, and has been adopted in so many cases that it can no longer be regarded as an experiment.

We have received from Messrs. Wilmer & Sons, of Bury-street, St. Mary Axe, E.C., a sheet containing a description and illustrations of Bond's "Patent Sunk-Fire Slow-Combustion Stove." The so-called "stove" is an open fire with a fire-lump body of good shape and 36 in. high to the flue-bend, which is of iron. A peculiarity of the hearth is that it is sloped down about 3 in. from the floor level to the back-hearth, on which the cast-iron grate for the fire rests; this grate is only 3 in. high, so that the top of it is level with the floor of the room. In the illustrations bull-nosed brick surrounds are shown, but metal surrounds can, of course, be used. Cold fresh air may be supplied to a chamber behind the fire-lump body, where it is warmed and from which the warm air is discharged into the room at any convenient level. The construction throughout is simple, and we have no doubt that the grate will give good results.

Messrs. Gaukroger Sykes & Roberts, of Halifax, send us their catalogue of gun-metal steam and radiator fittings. The "Fearnaught" steam valve is of the renewable disc type, now familiar to most steam users, and the radiator valves illustrated are of the angle pattern. Three patterns of gun-metal Peet's valves are included, these being suitable for steam or water. Steam plug cocks and other fittings in daily demand are also described.

BRITISH STANDARD CEMENT SPECIFICATION.

ONE of the most important findings published by the Engineering Standards Committee is the "British Standard Specification for Portland Cement" recently issued. This specification has been prepared by a Committee under the chairmanship of Mr. W. Matthews, C.M.G., and including engineers, architects, chemists, and others, representing the Admiralty, the London County Council, the Royal Institute of British Architects, the Institute of Chemistry, railway and dock companies, the leading contracting firms, and the chief cement manufacturers. The first meeting of the Committee was held in June, 1903, when Mr. Bertram Blount was desired to draw up a preliminary specification for discussion by the members. Twelve meetings have been held, and a large amount of information, collected from engineers, manufacturers, and users of Portland cement, has been carefully collated and considered by the Committee, with the result that the present specification was settled in its final form at a meeting held in November last year, and approved by the main Committee during the following month.

One of the first features which strikes the eye in connexion with this document is its commendable brevity, the letterpress covering only four pages, to which are appended three plates illustrating the dimensions of a standard briquette in the testing machine—the plan and elevation of jaws for holding the briquette in the testing machine, a full-size sketch of a needle for determining the setting time of cement, and a drawing of the apparatus for conducting the "Le Chatelier" test. So far as concerns "Quality and Preparation," the chief point insisted upon is that no material shall be added by the manufacturer other than calcium sulphate or water, to the extent in either case of not more than 2 per cent., but neither of these may be used if prohibited in writing by the consumer. Calcium sulphate, if used in the proportion of 1 to 2 per cent., only has the effect of retarding the setting of cement from a few minutes to several hours, but, if in excess, may render the material "blowy," and for this reason the limitation in the present report is distinctly wise. The clauses regulating sampling for analysis should be equally acceptable to users and manufacturers alike. Samples may be selected either at the manufactory or on the site of the works for execution, and when consignments of less than 100 tons are supplied, the manufacturer shall, if required, give a certificate for each delivery to the effect that such cement complies with the terms of the Standard Specification, no payment being made by the user for the certificate or for the tests and analyses involved.

With regard to the tests themselves, little exception can be taken. Fineness of grinding is to be ascertained by standard sieves, the first with 76 holes per linear inch and the second with 180 holes. The residue on the first sieve is not to exceed 3 per cent., and on the second is not to exceed 22½ per cent. These stipulations are more exacting than those hitherto prevailing, but, as increased fineness of grinding has been the chief cause of the improvement in the quality of cement during recent years, they should be generally welcomed. We are glad to see that no attempt is made to define chemical compositions, a matter that is almost entirely in the province of the manufacturer, whose business it is to supply a product that will successfully pass the tests relied upon by the user. The only points insisted upon in this clause are that there shall be no excess of lime and that the following percentages shall not be exceeded:—Insoluble residue, 1·5 per cent.; magnesia, which is apt to render cement "blowy," 3 per cent.; and sulphuric anhydride, 2·5 per cent. Tensile strengths are clearly defined for "neat" and "sand" tests, in connexion with which the settlement of a standard form of briquette will abolish a fruitful source of differences in results. Times of setting are fixed for three gradations of cement, designated as "quick," "medium," and "slow," the needle mentioned above being used to ascertain when the cement has set. Soundness is to be determined by the "Le Chatelier" method, which definitely indicates the expansion of the sample by the aid of very simple appliances.

The foregoing are the chief points in the British Standard Specification, the simplicity and brevity of which will commend it to all who use and manufacture Portland cement.

THE QUANTITY SURVEYORS' ASSOCIATION.

THE annual dinner of this Association was held on Thursday last week at the Freemasons' Tavern, Great Queen-street, W.C. Mr. Walter Lawrance, President, occupied the chair, being supported by Messrs. E. Guy Dawber, President of the Architectural Association, W. E. Riley, Superintending Architect to the London County Council, C. H. Barnsley, President of the Institute of Builders, A. J. Gate, London Vice-President of the Association, W. Hoffman Wood, Provincial Vice-President of the Association, A. W. S. Cross, A. A. Hudson, L. Maton, W. W. Thomas, F. B. Wade, F. H. Higgs, W. Hill, Alexander Ritchie, J.P., A. Wade-Palmer, H. England, F. B. Hollis, Secretary, and others.

The loyal and patriotic toasts having been honoured (Mr. W. E. Riley proposing and Mr. A. Wade-Palmer responding to "The Imperial Forces"),

Mr. A. J. Gate, F.S.I., proposed "The Quantity Surveyors' Association and its President." Having referred in eulogistic terms to the President, Mr. Gate said the Association was not a rival to any other society or institution, though a good deal of misconception existed on that point. But he did not mean that it had no enemies, for no Association could be started to repel abuses without making enemies, and they knew that in starting the Association they would make bitter enemies among what he was afraid must be called the blacksheep of the profession, whose practices were, he hoped, to be put down. Then there were those who were next-door to enemies—men who wished to join the Association, but who were not qualified to the extent it was desired that members of the Association should be, and who were consequently refused admission. It was open to these candidates to come up and pass the examinations of the Association, when they would be admitted. As to rivalry, it had been stated that they were in opposition to the Surveyors' Institution, but they were not. That Institution, of which he was a Fellow, had been in existence about thirty-five years, and its membership was from three to four thousand, and its revenue was considerable. Any idea of a young association like theirs being in rivalry with such a powerful body was absurd. It was alleged that there was no room for the

Association because the Institution existed, but that he was bound to traverse. If the Institution were supposed ever to have attempted to do what the Association were trying to do, then it had failed miserably. The status of the quantity surveyor had sunk and was sinking to a degree which they were ashamed to see. It was impossible for the Institution under its present charter to remedy the defects that ought to be remedied. How many quantity surveyors were Fellows of the Institution? Probably not more than 200; in other words, he did not think that 10 per cent. of the Fellows of the Surveyors' Institution were competent to take off quantities, but the letters F.S.I. led the public to think that a man was competent to do this sort of work properly. There were surveyors who would go touting for work, canvassing in a manner that tradesmen ought to be ashamed of, and, knowing that the proper fees for a job were 1½ per cent., would offer to do work at ½ per cent. These things were well known. Quantities taken with the greatest negligence were issued, and yet no redress was ever given. He was prepared to justify what he had said and was willing to give the Council of the Institution information on the subject. The Association proposed to alter all that, but they could not do so unless all reputable quantity surveyors helped them. One man could not fight a system, but when all the best men in a profession would join, any system could be fought. As members of the Association they were entitled to put letters after their names which would be proof to architects and others that they were competent men, for no man was admitted to their ranks unless competent. Even if an incompetent man did succeed in joining the Association, by rule 13—which said that a surveyor belonging to the Association who did not do his work accurately or pay for his errors should cease to be a member—he would soon be compelled to leave them. The rule stated—and this was what the Institution had never attempted to do—that the Council of the Association would inquire into any error made in the quantities by a member of the Association, and if the member was in fault and would not pay then the Association would expel him. Quantity surveyors owed it to their brethren not to try and get all the work they could at unfair prices, and the Association intended to prevent them doing so in all ways it could. A committee had been appointed, and they hoped to agree to a minimum scale of charges that every member of the Association should charge. He was inclined to think that if they did this the Institution would be compelled to follow them, and as a sign of the times he might mention that the Institution had this year elected a quantity surveyor as its President, and had appointed a committee, and had done several other things for the quantity surveyor; and he could not help asking whether they would have done so had there been no Association. The quantity surveyor's duty towards the building owner was to protect him, and when building owners knew what the quantity surveyor did for them they would employ their own quantity surveyors. The principal duty of the surveyor to the builder was to be accurate in the bill of quantities, and as to the surveyors' duty to the architect, the first was the most difficult to fulfil—*i.e.*, to get behind the mind of the architect and find out what he really wanted. Many difficulties arose and serious extras resulted from surveyors accepting what was drawn and what was written in the specification. Specifications were often ambiguous, and a competent surveyor carefully removed all ambiguity.

The Chairman, in reply, said that Mr. Gate had so fully set forth the objects of the Association that he had left little to say on that score. The Association had not been started without much trouble and difficulty, and now that they had succeeded in getting incorporated it remained for the members as a body to do the rest. He appealed to them not to sit still and wait for everything to be done for them. Every member must give the Association his loyal support. In trying to attain the objects of the Association there was no doubt that the members would have to exercise a little unselfishness, and perhaps at times a little self-sacrifice would be needed, especially in remaining loyal to their brethren by not accepting work below the minimum fees set forth by the Association. If quantity surveying was to continue on the honourable basis of a profession, and a decent living was to be made out of it, they could not countenance the reduction of fees to the rates at which some men were offering to do quantity surveyors' work. It was simply impossible for work to be done with proper skill and care and a high standard maintained in the bills of quantities they issued it the fees were to be reduced to the equivalent of an office-boy's wages. Those who took a pride in their work and sent it out properly done knew thoroughly well that work accepted at ridiculous fees could only be produced by untrained, inexperienced, and underpaid assistance. They must therefore do what they could to impress upon public bodies and committees the fact that quantities require skilled and experienced assistance in their preparation, and below a certain minimum charge it was impossible to do the work properly. He was sure that all architects of experience knew the value of good work by the quantity surveyor, and appreciated the great assistance which his care was to them in pointing out little difficulties in details of construction which could not be noticed in the preparation of the drawings, and also the great amount of worry and friction saved with the contractor during the carrying out of the work. As to the contractors, there was nobody who appreciated more the value of really good bills of quantities than the experienced estimator, and as they appreciated good work, he must say it was a pity they could not return some of the rubbish which they received as quantities. The well-prepared bill of quantities was in the end by far the greatest economy; it enabled the estimator to calculate his prices to a nicety and also with satisfaction. As to quantities being part of the contract, he had always maintained that if they were it put a premium on bad work. When quantities were part of the contract, the responsibility of the quantity surveyor was taken away, and any mistakes the surveyor made had to be paid for under the contract by the building owner, and that was not right. The article of the Association that Mr. Gate referred to they regarded as one of their strongest points, but it would be nullified with the bills of quantities part of the contract, as then the surveyor was entitled to put into the variation bill any errors on either side, and the building owner had to pay. It was said that if the surveyor made such mistakes he would not be employed another time; that was so, but what redress was afforded the building owner? Another point he might refer to was as to the appointment of surveyors as arbitrators in disputes, especially in measurements and quantities. In the majority of disputed building accounts the quantity surveyor was the most competent man to act as arbitrator. If an architect had enough work to do, he did not want to be bothered with quantities in any way. As to the mode of measurement, he thought it would be one of the best works that the Association could undertake, if they could establish a universal mode of measurement. London quantities were well understood by most estimators all over the country, and in most cases were preferred to any local method, and if a universal method was to be adopted, he thought there was every chance that it would be based on the London practice, but before that could be done London surveyors must be got to agree on a uniform practice among themselves. This being the first dinner of the Association, he thought it was a matter of congratulation to have such a representative gathering. He would ask their Secretary to state a few facts with regard to the Association, and he would take the opportunity of expressing to Mr. Hollis their deep gratitude for the time and attention he had given to the Association.

Mr. F. B. Hollis said that Mr. W. Hoffman Wood might be considered the father of the Association, as it was he who wrote to the *Builder* of January 3, 1903, a letter suggesting the formation of such a body, and he (the speaker) replied in the following issue, and was eventually the means of the Association seeing the light. This was the first dinner, and it was very pleasing to have such a good attendance. They had had upwards of 300 applications for membership, and they had elected 130 members; they had become incorporated, and were recognised as an official body useful to the public; and already they had been recognised by a Public District Council who, in advertising for a quantity surveyor, suggested that applicants should be members of the Association. One of the provincial members of the Association had recently asked the Council for support in a case of litigation over fees for services rendered, and he believed that assistance would be given. The first examinations were to be held in May next, and he had already received 130 applications for the syllabus. The assistants' employment register was already operating effectively, and there were a number of capable assistants on the register vouched for by responsible members, and he had already satisfactorily answered several applications for assistants. In conclusion, Mr. Hollis referred to the kind and generous help Mr. Lawrance had afforded him and the Association.

Mr. W. Hoffman Wood proposed "The Architects," and asked why architecture was not placed among the learned professions—with law, physic, and divinity? With the toast he coupled the name of Mr. E. Guy Dawber.

Mr. Guy Dawber expressed the thanks of architects to quantity surveyors for their help and assistance. He thought it was a mistake for architects to take out their own quantities, for it put the architect in an entirely wrong position when he had to be, as it were, the judge of his own work. He did not think the architect could take an impartial view of quantities when he took them out himself—but, of course, it was done. With regard to the emoluments of the quantity surveyor, he thoroughly agreed with what had been said. As to the question of drawings, quantity surveyors did sometimes get bad drawings and specifications which were unintelligible, but he thought the matter had been made too much of. A good architect prepared his own details and wrote the specification himself. It seemed impossible for an architect to get to know what he wanted unless he wrote the specification himself, and if that were done we should not hear these complaints about architects. He wished the Quantity Surveyors' Association every success. It had been his privilege to meet only the upright and honourable men of their profession.

Mr. W. R. Hood then suitably proposed "The Contractors," and Mr. C. H. Barnsley responded.

The concluding toast was "The Visitors," proposed by Mr. H. England.

Mr. A. A. Hudson, in response, said he had never met any of the black sheep referred to by Mr. Gate.

Mr. Alexander Ritchie said he had lately rebuilt his premises in Upper Thames-street, and the quantity surveyor engaged in that work certainly was not paid the minimum rate which the Association proposed, but perhaps that was because he was a Scotsman.

THE BUILDERS' FOREMEN AND CLERKS OF WORKS' INSTITUTION.

THE annual dinner of the Provident Institution of Builders' Foremen and Clerks of Works was held on Saturday last week in the King's Hall, Holborn Restaurant, when 550 members and friends of the Institution were present. The chair was occupied by Mr. H. W. Horner (Messrs. Ashby & Horner), and there were also present Messrs. C. H. Barnsley, President of the Institute of Builders, E. B. I'Anson, E. J. Burt, H. T. A. Chidgey, J. C. Hill, Ernest Horner, L. Horner, G. Hubbard, T. Rider, Alexander Ritchie, J.P., W. A. Sheppard, T. Stirling, and Deputy Ben Turner, C.C.

The loyal toast having been honoured,

The Chairman, in proposing the toast of the evening, "The Provident Institution of Builders' Foremen and Clerks of Works," said that the foreman was a man with many masters to serve—the builder and architect, the architect's client, the clerk of works, the trades' union leader (who called upon him because his bricklayers were putting away the bricks too fast), and "the bane of the builders' life," the sub-contractor—something worse than that had lately sprung into existence, *i.e.*, the sub-contractor's sub-contractor. For this reason a builder's foreman had to be a man of many parts, and must have many qualifications. With regard to the clerk of works, it had been his good fortune to come in contact with a great number of these men during his thirty years' connexion with the building trade, and he had ever found them a great help to the builder in carrying out his work and getting matters settled. These were the manner of men who composed the Provident Institution of Builders' Foremen and Clerks of Work. The Institution was not supported wholely by charity, for the members subscribe 3s. 4d. per month, and this was one of the good features of the Institution, for men were induced to be thrifty, and he

appealed to all those in that room to put something away for a "rainy day." As regards the working expenses of the society, the total sum for last year was 40*l.* 16s., which could not be considered excessive when 3,000 letters, for instance, had to be dealt with. One of the professed objects of the Institution was to maintain the respectability of its members, and an excellent rule was also made that an intending member must have followed some branch as a craftsman of the building trade. Since the first pension was granted close on 12,600*l.* had been paid away, but of course without the annual support of architects, surveyors, builders, and merchants the pensions would not be nearly so large, 17s. 6d. per week being now paid. Before he resumed his seat he should like to refer to one who had recently passed from among them, and who so ably filled the chair in the year 1888, *i.e.*, Mr. Thomas Blashill, who lived the life of a thorough English gentleman. The Chairman concluded by appealing for financial help on behalf of this deserving Institution.

Mr. J. Beer, Secretary, in response, said that since its earliest days the Institution had gone on growing, but it needed help because of the many trials of foremen and clerks of works. He was of opinion that one cause of the slackness of trade was the high cost of production, and if workmen paid more attention to quality than quantity one would not hear so much about the unemployed. In these days a foreman was quickly worn out, and on behalf of the Institution he appealed to them for help. One builder's foreman who had just died, and who paid into the funds of the Institution about 40*l.*, had received in pension money over 500*l.*, and another member and his wife had received over 225*l.* for a comparatively small sum paid in. Was there any other institution that gave such help for such small contributions? Two pounds a year was the cost of two ounces of tobacco per week, and yet some men said that they could not afford the subscriptions! The Institution had been in existence over sixty years, and he hoped it would continue to receive the support that had always been given it.

Mr. C. H. Barnsley, in proposing "The Architects and Surveyors," said that much present-day architecture, whether domestic or municipal in character, would, he believed, testify to future ages that for skill and originality it was equal to anything that had been done in the architectural history of the nation. No doubt we had changed in methods and design, but there was no reason for alarm in that, for, as Ruskin said, "No art can be noble which is incapable of expressing thought which does not change." There were also architects who were to be admired for their energy and unselfishness—men who had risen to the highest platform in fame, and yet were willing to sacrifice time and money to inculcate in the minds of younger men knowledge of a technical character. In the provinces builders and contractors rather envied London builders, for in London there were a number of very able quantity surveyors. If provincial builders could get quantities prepared by London surveyors, he thought that many of them would always be glad to accept the responsibility of those quantities—a thing they were not always willing to do now.

Mr. G. Hubbard responded for the architects, and in doing so he said there were many builders' foremen and clerks of works who did not belong to the Institution, and he thought it was the duty of all the members to get those outside to join them. Those who had joined were laying up for themselves the possibility of living in comparative comfort when their life's work was practically over, and in joining such an Institution they saved themselves many years of doubt and trouble which must come to those who lived upon and spent all their weekly money. As to the registration of architects, he held strong views on the subject. It was not fair to the fully qualified architect that he should be put in competition with the untrained architect. He was glad to notice that that was the view which most of them took, and he was not surprised that they did, seeing that they were all practical men who had to work most of their lives under the architect's guidance.

Mr. H. T. A. Chidgey, who responded for the surveyors, said he thought that the alliance between the foremen and clerks of works tended towards complete efficiency in the carrying out of works they were in charge of.

Mr. Deputy Ben Turner, C.C., then proposed the toast of "The Builders and Contractors." He said he remembered when London was a very different London from what it is now, and it was in recent years that so many fine buildings had been erected. Both architects and builders were greatly helped in their work by their clerks of works and foremen. In referring to the Building Act Amendment Bill, he said he hoped they were all interested in that, as they should be. That Bill meant confiscation of property; it meant that, should it pass, there would be no possibility of them having a timber yard in London, and he doubted very much whether they would be able to have a joiner's shop in London.

Mr. E. J. Burt suitably replied, and spoke of the advantages to foremen and clerks of works of membership of the Institution.

Mr. F. Hann, Financial Secretary, then proposed the toast of "The Governor (Mr. F. J. Dove), Trustees (Messrs. F. J. Dove, J. Howard Colls, and T. Costigan), Donors, Subscribers, and Visitors."

Mr. W. A. Sheppard having replied, the toast of "The Chairman," proposed by Mr. J. C. Hill, brought the proceedings to a close.

During the evening donations and subscriptions to the amount of 370*l.* were announced, including 25 guineas by the Chairman and 25*l.* by Messrs. Ashby & Horner.

CARPENTERS' HALL LECTURES:

OUR OLD PARISH CHURCHES.

ON Thursday evening last week the Rev. W. Marshall, M.A., F.S.A., delivered the second of the present series of Carpenters' Hall Lectures, on "Our Old Parish Churches," at Carpenters' Hall, London-wall. The lecture was illustrated by a large number of lantern illustrations. In the course of his remarks Mr. Marshall said there were some 9,000 mediæval parish churches in the country. For close on twenty years he had taken a great interest in the subject, and had visited 586 of those churches, which he had photographed and made notes upon. Dealing with the question of lych gates the lecturer remarked that ancient examples of those gates were very rarely met with, because they were generally made of wood, and, being exposed to the weather, they had decayed. After dealing with the memorial stones to be found in churchyards, Mr. Marshall passed on to a consideration of churchyard crosses, and by means of the lantern showed a number of photographs of such crosses from various parts of the country. One of the photographs was that of the cross in the churchyard at Higham Ferrers, and the working of the stone at the angles into what looked like crockets, but were really imitations of the oak-leaf, was pointed out. One of the most striking of such crosses was the cross at Somersby, the birthplace of Lord Tennyson. A cross which was at once beautiful and interesting was that at East Hagbourne, about 1¼ miles from Didcot. This example had a XVII. century sundial in place of the cross head. Passing on to deal with doorways, a number of these were thrown on the screen, among them being a pre-Norman door at Earl's Barton, in Northamptonshire. Another example was a late Norman door from Hales, in Norfolk, and another was the well-known doorway at Adel Church. The porch at the west end of Cley church, on the north coast of Norfolk, was an example of XIVth century work. Much of this church was unfinished, no doubt owing to the occurrence of the Black Death, which plague there was reason to believe was the cause of the large number of breaks to be found in churches which were erected in the middle of the XIVth century. The ironwork on the door of Cley church was remarkable for its beauty. Dealing with the question of church doors, Mr. Marshall said that in the very early days these were always made of great strength, but as time progressed the ironwork with which they were covered assumed a lighter and more decorative style. The handle-plates of church doors were very often splendid examples of metal work. At one time they were forged and worked with punches, quite a different style being evolved when the file came into use. Having touched upon sundials, the lecturer referred at some length to consecration crosses, which he said were divided into three types—those painted upon the plastering of the stone work, those incised in the stone itself, and those made of metal let into a matrix. As illustrating the first-mentioned type he showed a photograph of the cross at Hythe, in Kent; the second type was represented by the cross at Sellinge, in the same county, and the third, though only the matrix was left, was that at Salisbury Cathedral. Sanctus bells were another interesting feature found in our old parish churches. Generally they were hung on the exterior of the east gable of the nave or chancel, but were sometimes placed on the spire. The bell at Walpole St. Peter, Norfolk, was an excellent illustration of the former type, for it was in a marvellous state of preservation, only the small flying buttresses on the outside of the bell chamber being missing. Dealing with the subject of the chancel screen, Mr. Marshall said that the screens in West Country churches differed from those found in East Anglia in that they went right across the church, aisles and all, and very often had a sort of frieze running along the top. In East Anglian churches the screen was often intercepted by the chancel arch. Commenting on the peculiarities of a number of photographs of screens, the lecturer remarked that it would be observed that in many cases the screens exhibited a somewhat unfinished appearance. That was due to the fact that the rood loft was generally erected over them. He did not know of a single instance where the rood was now remaining over the chancel screen, for they were all swept away during the Reformation. At Croscombe, near Wells, there was a fine example of Jacobean screen work. It was very sad to think how in many churches Jacobean work had been swept away. There was no finer period of wood work than the Jacobean, and it was interesting to note that such work was usually dated. Referring to brasses, Mr. Marshall remarked that he was probably the first person to photograph them. He thought that a photograph gave a far better idea of the feeling of the brass than did a rubbing. The lecturer concluded by exhibiting a number of photographs of church pulpits, including several interesting examples of Jacobean wood structures.

Fifty Years Ago.

OXFORD ARCHITECTURAL SOCIETY.—The first meeting of this term was held in the Society's rooms, in Holywell-street, on Wednesday, the 14th inst., the Rev. the Rector of Exeter College, President, in the chair. The report of the committee expressed satisfaction at the selection of the successful design for the new museum. The President, in introducing the subject proposed for the evening's discussion, "The principles on which stained glass should be designed for use in churches," said that there was much need of some agreement on the very first principles which should guide those who design and erect windows. The Rev. T. Chamberlain, according to the Oxford papers, thought the great end of stained glass in churches was to excite feelings of devotion, and for this reason would exclude everything which did not tend to this end, or was calculated to suggest any other ideas to the mind. On this principle he would exclude mere mosaic pattern windows, and those in which symbols were the main subject, and simple diapers, allowing quarries surrounded by coloured borders. As in architecture, he would employ the best of its kind, namely, Second Pointed; so in glass, he would use the style of the XIVth century. As to the subject of naturalism and conventionalism, he was opposed to the grotesque as such, but would studiously avoid in the representation of natural objects anything which might seem sensuous. He condemned mere antiquarianism in glass. The Rev. J. E. Millard maintained that a design for stained glass ought to be entirely subservient to that of the window tracery, and to the general requirements of the fabric. Consequently he considered a regard to colour more essential than even correct drawing, though he was opposed to outlines intentionally grotesque. Mosaic patterns, and groups of small figures in medallions were, he thought, preferable to large independent figures, as they distribute rich and gem-like colours harmoniously, instead of exhibiting broad masses in violent contrast. Such colours should be relieved by a liberal use of white glass. He considered these principles applicable to any style or period. Mr. Parker thought no style of glass was to be absolutely condemned. He admired XIVth century glass above all other, but also considered windows in the style recommended by Mr. Winston, and those now made in Bavaria, as beautiful works of art, and ornaments of churches; and if he

had to fit in a Norman window he should certainly employ glass after the manner of that, for instance, at Canterbury. Mr. Bruton protested, as also did Mr. Chamberlayne, against the use of canopies; he thought mediæval artists would have inserted stone if they were needed. Mr. Parker did not agree with Mr. Bruton in that opinion.—The *Builder*, March 3, 1855.

Illustrations.

DRAWINGS BY MR. R. PHENÈ SPIERS.

IN connexion with the interesting event of the dinner and presentations to Mr. Spiers, recorded in another column, we thought it suitable to devote our illustration plates this week to reproductions of some of Mr. Spiers's fine drawings of ancient work, executed long ago, but which remain among the finest pictorial representations of ancient architecture that can be found.

They include illustrations of the Temple of Jupiter at Baalbek, the Propylæa at Athens, and the columned halls of Esneh and Karnak. Mr. Spiers has kindly added the following notes on the subjects of the drawings:—

TEMPLE OF JUPITER, BAALBEK.

This view of the temple was taken from the north-east in 1866, before the removal of the wall which had been built by the Moslems in between the antæ of the portico, possibly to protect the water cisterns which occupied the whole area of the cella and sanctuary. The clearing away of the *débris* by the Germans has now exposed the podium of the temple and added to its monumental effect. It has, however, destroyed, here as elsewhere, the picturesque grouping which existed in former days.

THE PROPYLÆA, ATHENS.

This view was taken in the shade afforded by the substructure which carries the Temple of Nike Apteros, a very important consideration in Greece, and one which in many cases limits the artist in his selection. In this instance, however, more is shown than is usual, and it is singular that the point of view should not more often have been chosen. At the extreme left of the drawing, down in the plain, is the Temple of Theseus, probably shifted a little to the north to bring it within the picture. The hills in the distance form part of the range in which, further east, are the famous quarries from which the Pentelic marble was obtained. The great pedestal, 55 ft. high, on the left of the drawing, was raised to the memory of M. Vipsanius Agrippa, son-in-law of Augustus, about B.C. 27. Marks on the summit suggest that it supported a chariot and horses. In the centre of the drawing is the Pinacotheca, the name given to the building which flanks the Propylæa on the left, probably because Pausanias in his description says:—"On the left of the Propylæa is a building with paintings," and then goes on to describe the subjects represented. No traces of painting have been found on the wall, and it has never been decided whether the pictures in question were frescoes or painted on wood. The three columns on the right form the northern half of the portico of the Propylæa, and the pathway in front of the marble steps is that up which the beasts were led to the sacrifice. A fragment of one of the capitals of the Ionic colonnade which carried the white marble roof is seen on the right. This roof seems to have attracted Pausanias's attention, who states:—"The Propylæa has a roof of white marble, and the size and beauty of the blocks were remarkable even when I saw it."

TEMPLE OF ESNEH.

In 1866 only the Hall of Columns of the temple at Esneh had been cleared out, so that this drawing was taken from a high level, displaying more clearly the detail in the capitals. The hall is of late date, B.C. 14—A.D. 69, which shows that the Romans made no attempt, in Egypt, at all events, to introduce their own style.

TEMPLE OF KARNAK, THEBES.

One of the avenues across the aisles of the great Hall of Columns. Owing to the eating away of the foundation of the base of one of the columns, it has fallen over as shown. How long ago this happened no one knows. Quite lately, in consequence of the falling over of a very large number of other columns, restoration has been found necessary to prevent the remainder being knocked over, and this column has, we believe, been raised and a proper foundation given to it.

ADDRESS TO MR. R. PHENÈ SPIERS.

WE give as one of our illustrations a monochrome reproduction of the illuminated address which was presented to Mr. Spiers at the dinner on Monday evening.

The writing was done by Mr. Grailey Hewitt, and surrounded by a most beautiful piece of illumination by Mr. Allan F. Vigers. The original is bright and brilliant in colour, but as we could not reproduce the complete colour design, we thought it best to print it in a sober tint, so as not to suggest any special colour, but merely give the design.

The following is the list of signatures attached to the address:—

London.

R. Norman Shaw	Hugh P. G. Maule
G. F. Bodley	Herbert Batsford
G. Aitchison	Louis Ambler
T. G. Jackson	H. Heathcote Statham
Aston Webb	Horace Field
John James Burnet	G. Thow Smith
W. R. Lethaby	Wm. Woodward
W. Curtis Green	H. D. Searles Wood
E. Guy Dawber	Michael Bunney
Walter Millard	William G. B. Lewis
Robt. Weir Schultz	Percy N. Ginham
Allan F. Vigers	W. Howard Seth Smith
Sidney H. Barnsley	C. E. Mallows
F. W. Troup	Alfred East
Theodore Fyfe	L. Alma Tadema
Gerald C. Horsley	A. H. Christie
Bernard H. Webb	S. Flint Clarkson
Vivian H. King	Henry Branch
Henry W. Stock	John W. Simpson
Alfred H. Hart	Cole A. Adams
Thomas Henry Watson	Ernest George
John Fulleylove	Alfred B. Yeates
George Harvey	Arch. C. Dickie
John Borrowman, jun.	J. W. Penfold
James Gandy	Henry Tanner
Metford Warner	J. Oldrid Scott
Rowland Plumbe	Wm. Murray
T. Raffles Davison	Francis J. Hames
Wilfred J. Hardcastle	Mortimer G. Pechell
Henry A. Saul	Philip A. Robson
Arthur J. Gale	Arthur Blomfield
W. T. Curtis	Eustace Corrie Frere
George J. J. Lacey	A. N. Prentice
Axel Herman Haig	A. E. Brooker
Howard Ince	Thos. Stirling Lee
H. R. Hope-Pinker	Edward S. Prior
Herbert Wigglesworth	A. Hessell Tiltman
W. Aumonier	Stephen J. B. Stanton
David Barclay Niven	R. Stephen Ayling
Chas. H. M. Mileham	Alfred C. Bossom
Lacy W. Ridge	Arnold S. Tayler
Alfred J. Shirley	H. P. Burke Downing
W. Harvey	Leonard Stokes
T. M. Rooke	Thomas B. Whinney
Ernest Newton	Wm. Emerson
Percy Bigland	Edmund Woodthorpe
Henry L. Florence	Reginald Blomfield
T. Blake Wirgman	Charles Henman
Jas. B. Fulton	F. M. Simpson
Stanley Hamp	Alexander Graham
E. R. Hughes	W. J. Locke
S. Melton Fisher	John Slater
Philip J. Marvin	Maurice B. Adams
J. J. Stevenson	Thos. M. Rickman
F. Hamilton Jackson	Richard J. Lovell
Matthew Webb	Arthur C. Martin
Geoffrey Lucas	Francis D. Bedford
T. Erat Harrison	Allan George
Charles Holroyd	Francis Bond
Herbert A. Bone	H. Tooley
C. Harrison Townsend	Peter Anderson
T. R. Spence	E. B. I'Anson
Emery Walker	S. D. Adshead
A. H. Hallam Murray	Edw. Dru Drury
W. H. Margetson	R. Elsey Smith
George Frampton	A. N. Campbell
Albert Toft	Albert W. Cleaver
Sidney Paget	G. H. Palmer
G. Woolliscroft Rhead	H. Percy Adams
Henry Hall	Robt. Robertson
Harry Redfern	Arthur E. Street
R. W. Collier	Thomas W. Cutler
Fred. M. Marks	A. R. Jemmett
Thos. E. Collcutt	Paul Waterhouse
Wm. H. Atkin-Berry	H. R. Goodhram
C. J. Tait	J. Douglas Matthews
Ed. J. May	Henry Longden
A. Maryon Watson	John Murray
S. Gambier Parry	John Taylor
C. J. Harold Cooper	Charles R. R. Clark
Francis Hooper	John Belcher
Arthur Stratton	H. O. Cresswell
Keith D. Young	W. D. Caröe
Ronald P. Jones	Walter Crane
R. S. Balfour	Ernest Crofts
James Paxton	T. G. Davidson
Arthur T. Bolton	E. A. Gruning
C. Lovett Gill	W. Goscombe John
Hugh Stannus	Prof. E. Lanteri
Leslie Wilkinson	Philip Norman
F. Dare Clapham	F. L. E. Pither
Norman Evill	A. B. Pite
Herbert Read	E. F. Strange
R. Falconer MacDonald	S. J. Soloman
Maxwell Ayrton	Frank Spiers
William A. Pite	H. Tanner, jun.
Thos. Edwin Pryce	Sidney Vacher
Herbert C. Corlette	F. T. Verity
Charles J. M. Marshall	E. W. M. Wonnacott
E. J. Milner Allen	E. P. Warren
Charles E. Sayer	W. E. Riley
F. T. W. Goldsmith	James Orrock
A. R. Brede	Macvicar Anderson
Graham Petrie	George Simonds
H. Walter Lonsdale	Wm. Flockhart
Walter Cave	Alfred Parsons
Walter L. Spiers	T. E. Knightley
Frank Fox	W. Campbell Jones
F. Forbes Glennie	George Sherrin
Douglas Cockerell	W. Hilton Nash
Lewis H. Isaacs	W. Church Howgate
George Elkington	Henry D. Davis
George Weald	John E. Sears
Bradley Batsford	

Provincial,

Thomas Worthington, Manchester.
Percy S. Worthington, ,,
J. W. Beaumont, ,,
S. Henbest S. Capper, ,,
J. Holden, ,,
Paul Ogden, ,,
Alfred Darbyshire, ,,
Alfred E. Corbett, ,,
John Swarbrick, ,,
Fra H. Newberry, ,,
Alex. C. N. Paterson, Glasgow.
W. Randolph, ,,
Wm. H. Howie, ,,
John Thomson, ,,
John Watson, ,,
Henry D. Walton, ,,
Alex. W. Gibbon, ,,
W. H. Bidlake, Birmingham.
William Henman, ,,
H. L. Goddard, Leicester.
Chas. J. Allen, Sheffield.
Edwd. M. Gibbs, Sheffield.
H. L. Paterson, ,,
John Bilson, Hull.
Edmund Sedding, Plymouth.
T. Rogers Kitsell, ,,
Wm. E. Barry, Scarborough.
Segar Owen, Warrington.
John B. Gass, Bolton.
Sydney Tugwell, Bournemouth.
Wm. Fawcett, Cambridge.
George Clausen, Newport (Essex).
Arthur S. Flower, Aldeburgh.
Frederick C. Lees, Stroud (Glos.)
Alfred H. Powell, ,,
R. M. Gruggen, Bristol.
L. C. Riddett, Ryde, Isle of Wight.
G. Baldwin Brown, Edinburgh.
James A. Morris, Ayr.
James Cromer Watt, Aberdeen.
Arthur Ernest Barnsley, Cirencester.
C. R. Ashbee, Chipping Campden.
George P. Bankart, Bromsgrove.
Robert Anning Bell, Didcot.
Thomas Drew, Dublin.
Thos. M. Deane, Dublin.

Foreign.

John Begg, Bombay, India.
W. Banks Gwyther, Calcutta, India.
S. S. Jacob, Jeypore, ,, ,,
I. S. D. Ahmadi, Bijapur,,
H. I. Tomalin, Kandy, Ceylon.
Percy E. Nobbs, Montreal, Canada
Cecil Scott Burgess, ,, ,,
W. Howe Greene, St. John's Newfoundland.
Herbert Baker, Johannesburg, South Africa.
Francis Edward Masey, Cape Town, South Africa.
W. Bevan, Pretoria, South Africa.
F. K. Kendall, Cape Town, South Africa.
T. A. Sladdin ,, ,, ,, ,,
A. Wyatt Papworth, Cape Town, South Africa.
Herbert Walker, Port Elizabeth, South Africa.
Reginald G. Kirkby, Pietermaritzburg, South Africa.
John Sulman, Sydney, Australia.
G. J. Oakeshott, Sydney, Australia.
R. M. Hamilton, Perth, Sydney, Australia.
S. Hurst Segar, Christchurch, New Zealand.
F. de J. Clere, Wellington, New Zealand.
C. J. Mountfort, Christchurch, New Zealand.
H. W. Bird, Hong Kong, China.
L. G. Bird, Hong Kong, ,,
W. R. Ware, Milton, Mass., U.S.A.
R. S. Peabody, Boston, Mass., ,,
Charles F. McKim, New York, N.Y., U.S.A.
R. N. Roberson, New York, N.Y., U.S.A.
Robert W. Gibson, New York, N.Y., U.S.A.
Charles K. Cummings, U.S.A.
W. Tyson Gooch, New York, N.Y., U.S.A.
R. H. Robertson, New York, N.Y., U.S.A.
William T. Partridge, New York, N.Y., U.S.A.
Herbert Jacques, Boston, Mass., U.S.A.
Charles A. Cummings, U.S.A.
Robert Day Andrews, Boston, Mass., U.S.A.
Frank Miles Day, Philadelphia, Pa., U.S.A.
T. Maclaren, Colorado, U.S.A.
J. Bevan Phillips, Douglas, Wyoming, U.S.A.
Francis H. Bacon, Boston, Mass., U.S.A.
J. L. Pascal, Paris, France.
A. Choisy, Paris, France.
C. Bartaumieux, Paris, France.
Baron H. von Geymüller, Baden Baden, Germany.
William Scott, Bordighera, Italy.
L. Beltrami, Milan, Italy.
Professor Rodolpho Lanciani, Rome, Italy.
S. Giampietri, Rome, Italy.
M. Belmas, Madrid, Spain.
E. M. Repulles y Vargas, Madrid, Spain.
Dr. P. J. H. Cuypers, Amsterdam, Holland.
T. J. T. Cupyers, Amsterdam, Holland.
J. A. Van Straaten, Junr., Amsterdam, Holland.
Jan Stuyt, Amsterdam, Holland.
H. P. Berlage, Amsterdam, Holland.
Alfred Bovill, Teneriffe, Canary Islands.
C. J. S. Hall, Puebla, Mexico.
Kingo Tatsuno, Tokyo, Japan.
Kotaro Sakauri, Kure, Japan.
Tatsugo Sone, Tokyo, Japan.
T. Sudsuki, Tokyo, Japan.

APPOINTMENT OF SANITARY OFFICERS.—The Local Government Board has sanctioned the appointment of the undermentioned sanitary inspectors in the City of Westminster:—Mr. A. L. Ware and Miss M. Carey.

CONGREGATIONAL CHURCH, SHIREBROOK.—Messrs. Williams, Brothers, & Co. (Chester) ask us to mention that their firm executed the leading glazing in the above-named church, the opening of which was recorded in our last issue.

THE BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

THE Annual General Meeting of this Institution was held on the 28th ult. at 21, New Bridge-street, E.C., Mr. J. Carmichael, President, in the chair. Among those present were Messrs. E. Brooks (the Hon. Treasurer), H. W. Parker, F. S. Oldham, Newling, Mackness, Gammon, Tarring, R. Barrett, and J. Austin, Secretary.

The report and balance sheet, which were adopted, showed the actual income of the past year to have been just upwards of 777*l.* During the year 606*l.* has been disbursed as annual pensions (24*l.* each to twenty-four widows and 30*l.* to one aged clerk), also 5*l.* granted as temporary relief. In addition, two orphans are being maintained and educated at the Orphan Working School, Haverstock Hill, per presentation of the Institution.

The adoption of the report was moved by the President, who stated that the employers had the interest of the employees at heart, and he felt sure master builders would support the work of the Institution.

Mr. R. Barrett seconded, and the motion was agreed to.

THE SURVEYORS' INSTITUTION.

THE usual fortnightly meeting of the Surveyors' Institution was held on Monday at No. 12, Great George-street, Mr. A. T. Steward, President, in the chair.

A donation to the library fund having been announced and a vote of thanks accorded to the donor, Mr. Harold Griffin read a paper on "Some Proposals for Improving the Law and Practice of Rating." Mr. Griffin said the Valuation Bill of 1904 indicated an intention on the part of the Government to amend the law relating to the assessment of property for the purpose of rating and taxation, and it was announced in the King's speech at the opening of the present Session of Parliament that the Government proposed to introduce a new measure this year dealing with the same subject. As, therefore, legislation was impending, the views of surveyors who are practically acquainted with the difficulties surrounding the subject could not be too widely made known. Where a Committee of a Board of Guardians had hitherto acted as the Assessment Committee of a district they had usually performed their duties in an able and impartial manner, and he saw no objection to such Committees being made the authority for hearing appeals, as they are in some parts of London and in the provinces. He had never heard it proposed that overseers should sit on Assessment Committees, and now that in London the Metropolitan Borough Councils were made the overseers of parishes within their boroughs, it did not seem right that a committee of such a council should adjudicate upon appeals from their own assessments, even if representatives from the London County Council sat with them. The London County Council and the Metropolitan Borough Councils held so much rateable property themselves as actual occupiers, that it must be difficult for them to perform the duties of hearing appeals in an impartial manner. He thought that the local Bench of Justices would be a more suitable body to act as an appeal committee.

In connexion with the hearing of appeals, the practice was for the appellant, after he had stated his case to the Committee in the presence of the overseers, and replied to questions put to him by both of these bodies, to be asked to retire while the Committee considered their decision in the presence of the overseers. This was not proper, and the overseers should also be asked to retire.

It had been customary before the last two or three quinquennial valuations in London for the London County Council to summon a conference of all the Metropolitan local rating authorities for the purpose of drawing up rules to be observed at the forthcoming valuation. The report of the conference held in 1904 had just been published. Some of the rules were reasonable, and he would only refer to those which seemed to him to be open to objection.

Rule No. 1.—***Weekly and Monthly Tenancies.***

(*a*) That in converting weekly and monthly tenancies into hypothetical yearly tenancies for the purpose of arriving at the gross value, the annual payments for rates (including water) and house duty (if any) shall be deducted from the annual amount receivable by weekly or monthly payments, which deductions are estimated at from one-fourth to one-third, according to the amount of the rate in the pound.

(*b*) That in case of artisans' dwellings each tenement shall be regarded as a separate hereditament for assessment purposes.

Note.—Allowance for the additional expense of a caretaker and common staircase may be considered as included in the statutory deduction.

(*c*) That for the purpose of ascertaining the scale to be adopted for assessing weekly and monthly properties, an average of the rates for each particular parish for the five years previous to the quinquennial valuation year be taken, and that such scale be adhered to throughout the quinquennium.

If the deductions from the annual full rents to find the gross value were fair in the case of cottage property, how could it be also fair in the case of tenement houses and blocks of dwellings to say that the additional outgoings for cleansing and lighting the common staircase were to be considered as included in the statutory deduction from gross to rateable value?

The stipulation that the average rates for the five years preceding the year in which the new assessment was made should be adopted as the basis for the scale on which the rating was to be fixed for a period of five years, beginning in the year subsequent to that in which the assessment was made, was open to serious objection. The upward tendency of the rates had lately, in many places, been so rapid that the difference of one year earlier or later in the period selected for an average might make a substantial difference.

Rule No. 3 attempted to define the method for the assessment of properties let on lease, but in a great majority of cases the value could be more easily and satisfactorily ascertained by evidence of the actual annual value and by comparison with the rentals being obtained from similar premises close by.

In dealing with freehold and long leasehold properties (presumably in the owner's own occupation) Rule No. 4 sets out the general principle of rating. "That the rent which a yearly tenant might be expected to pay shall be taken as the gross value." This apparently limited the application of the rule to a particular class of property, whereas the principle could be usefully employed as a primary consideration on a much more extensive scale.

Rule No. 5, "That in the case of any two or more houses in the same street or road containing the same number of rooms, and alike in every particular as to accommodation, but let at various rents, the average rent shall, unless there are exceptional circumstances, be taken as the basis of assessment," enunciated what was called the "Terrace Principle," which he considered altogether erroneous and unjust. Every hereditament should be assessed on its own merits, and the value of adjoining premises should be used only as a guide and not as a hard and fast rule to determine the value of ten or twenty adjoining and apparently similar houses. The actual rents of these houses might vary considerably, and wherever this was so there were nearly always circumstances which would account for the discrepancy. Surely these were the exceptional circumstances referred to in the rule. If this was admitted the rule became inoperative, but his contention was not accepted by many assessment committees.

Rule No. 14 contained a stipulation which was, he thought, very improper. It was that newly-erected premises should be assessed although not yet occupied. How could this be done legally? Surely when any property was inserted in a provisional list, notice must be given to the occupier, but in such a case as referred to in that rule there was no occupier.

If the system of general quinquennial re-assessment in force in London was to be applied to the rest of the country, as was intended by the Bill of last session, great practical difficulties would result unless a fair proportion only were reassessed in each year. The pressure of professional work during the time the valuation lists were being prepared and revised by the Assessment Committees was tremendous, and if similar proceedings were to go on simultaneously all over the country, the authorities and ratepayers must be to a great extent deprived of the services of the counsel and the surveyors most experienced in that class of practice.

Outside London a ratepayer could appeal against the assessment on his premises practically at any time, but in the metropolis, unless the authorities made a new assessment, a ratepayer could only appeal against the valuation list made every five years, during the twenty-five days allowed for objections after the list had been deposited. As it seemed probable that the quinquennial system of assessment might be extended all over England, it appeared to him very important that ratepayers should have the right of appeal at any time without reference to the quinquennial valuation. There must, of course, be proper times for giving notices, etc., but the penalty of sending them in too late should not mean a delay of more than one year in the hearing of the appeal.

The right which at present the overseers had of appealing to quarter sessions against the decision of an Assessment Committee who had reduced an assessment should be considerably restricted. No ratepayer would run the risk of an appeal to quarter sessions unless the amount at stake was substantial, as even if the Court made a sensible reduction in the assessment, it did not always give the appellant his costs, and a ratepayer was very heavily handicapped when he had to go to quarter sessions.

He was quite aware that he had not exhausted the topics which might be enlarged upon in connexion with rating, and that there was room for wide difference of opinion on most of them; but, if their discussion would assist in placing the individual ratepayer on terms of equality with the powerful bodies who were often his adversaries, that paper would not have been written in vain.

On the motion of Mr. Edgar Harper, seconded by Mr. Castle, a hearty vote of thanks was accorded Mr. Griffin for his paper.

It was announced that the next meeting will be on March 13, when a paper will be read by Mr. E. Morton on "Surveyors' Reports and Certificates."

The meeting then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

III.—NEW SESSION HOUSE, OLD BAILEY, AND COUTTS' BANK, STRAND.

THE opportunity of viewing two new London buildings of considerable importance attracted a large attendance of members of the Architectural Association on the occasion of the third spring visit on Saturday, the 25th ult.

At the Old Bailey Sessions House the visitors were taken over the building, in the absence of the architect, Mr. E. W. Mountford, by his representative Mr. F. D. Clapham, who gave much valuable information respecting the work which at the present time is in a very unfinished state. We have at various times referred to this important design and to its famous predecessor; on June 30, 1900, however, we gave illustrations of the plans, elevations, and views of the exterior and interior of the new building, and although it is now enveloped in a forest of scaffolding, we could not see that any material departure had been made from the competition drawings. The interior, however, has been improved in many points of detail, but to the exterior, which would appear to require a bolder treatment, we hope to refer at some subsequent date. There is, however, promise of some excellent ultimate effects in the working out of the courts and waiting halls.

In course of construction various discoveries of archæological interest have been made, notably the foundations of the original New Gate and a length of over 150 ft. of the ancient Roman wall. We gave, in our issue of November 17, 1900, a sketch of a fragment of the latter, showing the rubble walling and red-tiled bands which is typical of Roman work.

The new building, costing 282,000*l.*, stands upon a 5 ft. concrete raft placed about 35 ft. below the level of Newgate-street on a clay subsoil, and a thickness of 12 ft. of concrete is obtained to receive the central masses and dome. In consequence of an extensive system of plenum ventilation, a large amount of extra basement work was required; here are to be seen great chambers and air ducts with rounded corners and angles and all the multiplex parts which add enormously to the cost of the structure.

Iron, concrete, and brick are the constructional materials, and it is not a little disappointing to see the yellow Mansfield stone, with which the interior is principally faced, applied to the carcase in the manner in which terra-cotta or faïence are usually employed. There is a better feeling in the inner dome, where the stonework is performing constructive work. The colour is most pleasant and the detail is well considered in view of the peculiar lighting. Comparatively speaking, little inner daylight is provided within such a large area of site built upon, and we are doubtful of the results in this respect in certain of the corridors.

The base of the fronts is of Cornish granite, and the whole of the superstructure faced in

Portland stone, worked entirely by machinery. This latter element accounted for the unpleasant smoothness seen throughout the masonry. The central dome is to be built of steel and concrete and covered with copper.

Many varieties of marble are to be used in the internal decoration, and various well-known artists will enrich the surfaces at disposal with sculpture and painting ; to all of this, however, we shall refer when the great work is nearing completion.

By the kind courtesy of the partners of Messrs. Coutts & Co. the members had the privilege of viewing their new banking premises in the Strand. Mr. J. McVicar Anderson, the architect, was prevented from attending, but an able substitute was found in his son, who exhibited working drawings and discoursed upon the design and upon the methods resorted to in making the building fire and burglar proof.

The premises, as is now well known, occupy the site of the Lowther Arcade, which was demolished when the bankers acquired a Crown lease of the ground. The nature and history of the previous buildings are not without interest, and we would refer our readers to detailed references in the *Builder* of June 8, 1901, and May 10, 1902, for such information.

Although the site has great length, the two end frontages are comparatively narrow, leaving some difficulty in lighting the interior portions. The type selected by the architect is that of the basilica, in which the central space is lighted by clerestory windows and the aisles or side spaces by small domed lights. This, he considers, in some notes supplied to the visitors, is the historically correct form for a bank. A very successful and adroit use is given to the apse in masking the acute angle made by the main front with the axis of the interior ; the illusion would have been even more complete if the pier in the centre of the apse had been a recess or void.

Many of the time-honoured customs practised in the old premises are retained in the new building. There are, for instance, no partners' rooms, but principals and clerks work together. Ostentation, either in personal matters or in the decoration of the interior, is entirely absent, and this quality has influenced the design throughout, although the dignity of the establishment is in no wise impaired in the classic treatment.

The basement is principally utilised for strong rooms, the ground floor for the actual business of the bank, and the upper floors, fronting the Strand and Adelaide-street only, for resident officials' quarters and domestic purposes.

Portland stone is again the material employed in the fronts, while the roofs are covered with green Westmorland slates. The internal walls above the oak dado are distempered in plain colours ; glazed or polished surfaces so much sought after in these days are singularly absent, save for the marble floor. The general internal effect, although disturbed by an oak screen, is satisfying and restrained.

THE LONDON COUNTY COUNCIL.

THE ordinary weekly meeting of the London County Council was held on Tuesday in the County Hall, Spring Gardens, S.W., Mr. J. Williams Benn, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, it was agreed to lend Paddington Borough Council 5,833*l.* for contribution towards cost of reconstruction of Westbourne Park bridge, and Wandsworth Borough Council 9,140*l.* for contribution towards cost of street improvements.

Jobbing Works—Schedule of Prices.—The General Purposes Committee brought up the following report, the recommendation being agreed to :—

"The Council has recently, on the recommendation of the Education Committee, referred to the Works Committee for execution certain drainage and other works at schools. As no bills of quantities were prepared for these works, which are being done under the supervision of the architect (Education), it was proposed that they should be measured up and valued under the schedule in force for architectural jobbing works. That schedule, however, does not provide for the special work involved in the drainage of schools and similar work, and the architect (Education) and the manager of works suggest that the prices in the schedule in operation under the late School Board for London, plus 11½ per cent., should be adopted as the basis on which the value of the works in question should be calculated. We are of opinion that the suggestion should be adopted. We recommend that for the purpose of calculating the value of certain drainage and other works at schools which have been referred to the Works Committee for execution as jobbing works, the prices in the jobbing works schedule in operation under the late School Board for London, plus 11½ per cent., be adopted."

New Medical Officer.—The Establishment Committee recommended that Mr. A. A. Musson (Liverpool) should be appointed assistant medical officer in the public health department at the commencing salary of 500*l.* a year, rising to 800*l.* a year. In accordance with the standing orders two other names were submitted, and on the motion of Mr. Spokes an amendment was, after discussion, adopted to the effect that Mr. Wanklyn (London) should receive the appointment.

Indication of Houses of Historical Interest.—On the recommendation of the Local Government Records and Museums Committee, it was agreed that the undermentioned houses of historical interest be commemorated by means of memorial tablets :—(*a*) No. 12, Savile-row, W. (George Grote.) (*b*) No. 10, Upper Cheyne-row, Chelsea. (Leigh Hunt.)

The London Building Act.—On the reception of the report of the Parliamentary Committee, Mr. Phillimore asked the Chairman whether the Committee would issue a memorandum on the Building Act Amendment Bill, so as to make some points clearer.

Sir Thomas Brooke Hitching asked whether, in view of the general opposition to the Bill throughout London, the Chairman would take into consideration the desirability of withdrawing the Bill, and so saving the ratepayers' money.

Mr. Napier said the Committee had already considered the possibility of issuing a memorandum, and at the last meeting of the Committee it was decided not to issue it at the present time. It might be possible to do so later on. The Committee would continue to press on the Bill with all the strength it has in its power.

The New County Hall.—In reply to Colonel Rotton, Mr. Cleland, Chairman of the Establishment Committee, said that the committee has had the question of a site for a new hall under discussion on more than one occasion, but they had come to no final decision on the matter. Whenever they did arrive at such a decision, they would see that it was immediately reported to the Council.

Other business was transacted, and the Council adjourned.

APPLICATIONS UNDER THE LONDON BUILDING ACT, 1894.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses :—

Lines of Frontage and Projections.

Lewisham.—A house on the southern side of High-road, Lee, to abut upon Rembrandt-road (Mr. A. S. Gover for the House Property and Investment Company, Ltd.).—Consent.

Lewisham.—Open porches in front of proposed houses, Nos. 9, 10, 11, and 12, Murillo-terrace, High-road, Lee (Mr. A. S. Gover for the House Property and Investment Company, Ltd.).—Consent.

Hackney, South.—Deviation from plans for the erection of additions to a building at No. 17, Sutton-place, Hackney, to abut upon Urswick-road, so far as relates to the addition being erected in the position shown (Mr. J. Hamilton for Mr. T. C. Wootton and Messrs. Barlow & Son).—Consent.

Lewisham.—A dwelling-house on the eastern side of Salehurst-road, to abut also upon Manwood-road (Mr. J. W. Webb).—Consent.

Fulham.—Buildings on sites on the west side of Munster-road, Fulham, abutting upon the north and south sides of Colehill-lane (Mr. J. T. Brown).—Consent.

Lewisham.—A porch at No. 12, Homecroft-road, Sydenham (Mr. A. T. Haines for Messrs. Cakebread, Robey, & Co.).—Consent.

Lewisham.—Six houses on the southern side of Codrington-hill, Brockley-rise, Lewisham (Mr. V. Vagnolini for Mrs. S. K. Standen).—Consent.

Strand.†—Two projecting signs at No. 149, Oxford-street (Messrs. S. Jones & Co. for Messrs. Crane & Sons).—Consent.

Width of Way and Lines of Frontage.

St. Pancras, West.—A projecting porch at Rowton House, Arlington-road, Camden Town (Sir Richard Farrant for Rowton Houses, Ltd.).—Consent.

Clapham.†—An addition and projecting steps in front of the chapel situate between Nos. 13 and 15, Clifton-street, Wandsworth road, Clapham (Mr. E. W. Collins for the building committee of the Howard-street Gospel Mission).—Refused.

Width of Way and Space at Rear.

St. George, Hanover-square.—An addition at the rear of the London Soldiers' Home, No. 6, Eccleston-street, St. George, Hanover-square, to abut upon Eccleston-street East (Mr. R. Curwen for the London Wesleyan Soldiers' Home Committee).—Consent.

Space at Rear.

Strand.—Alterations at the rear of the Hotel Dieudonné, Nos. 7, 9, and 11, Ryder-street, St. James (Mr. W. Woodward for Mr. C. Guffanti).—Refused.

Deviation from Certified plans and Projections.

Strand.†—Certain deviations from the plans certified by the District Surveyor under section 43 of the Act, so far as relates to the proposed rebuilding of Nos. 228 and 229, Piccadilly, and No. 39, Haymarket, and do consent to the erection of projecting oriel windows, angle turret, and balconies to the new building (Mr. W. Woodward for Messrs. Manfield).—Consent.

Means of Escape from the Top of High Buildings.

Marylebone, West.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act on the fifth (top) story of Nos. 376 to 384 (even numbers only), Oxford-street, Nos. 1 to 7 (odd numbers only), James-street, and Nos. 1, 2, and 3, Bird-street, St. Marylebone (Messrs. A. E. Hughes & Son).—Consent.

Space at Rear and Means of Escape from the Top of High Buildings.

Holborn.—A modification of the provisions of section 41 with regard to open spaces about buildings, so far as relates to the proposed erection of a building upon a site on the east side of Southampton-row, Holborn, abutting also upon the south side of Fisher-street and north side of Eagle-street (Messrs. Bradshaw & Gass for the Royal London Friendly Society) ; that Messrs. Bradshaw & Gass be informed that the Council has considered the plans submitted by them on behalf of the Royal London Friendly Society, showing the means of ecape in case of fire proposed to be provided in pursuance of section 63 of the Act on the seventh (top) and sixth stories of a building upon a site on the east side of Southampton-row, Holborn, abutting also upon the south side of Fisher-street and north side of Eagle-street.—Consent.

The recommendations marked † are contrary to the views of the local authority.

ARCHITECTURAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—A meeting of this Association was held on the 17th ult., when Mr. William Henman read a paper on "The Future of Our City." How little people thought of the effect of architecture on the character of a town or city, said the lecturer, was only too apparent. Notwithstanding many excellent qualities possessed by the people of important centres, there was an absence of a collective taste in art. Individual taste and artistic spirit existed, but this failed in its effect through a want of collective appreciation. They must do something to broaden this artistic spirit, and to create an interest in the architecture of our streets, so that an ugly building offended as would a discordant sound. After giving his impressions of Birmingham on his first visit thirty-three years ago, he observed that he might say without hurting the susceptibilities of those native to the city, that there was still ample room for improvement. There had been too much self-gratification displayed since Birmingham was called the best governed city in the world. Mr. Henman asked his hearers whether, from an architectural standpoint, Birmingham had kept reasonable pace with its prosperity ? The new Corporation-street might, continued Mr. Henman, be made an ornament to the city or the very opposite. He regretted that the street was begun under the Workmen's Dwellings Act rather than as a street improvement. The line adopted for it was by no means the best available. Many of the streets crossed at awkward angles, and the older streets were damaged as business thoroughfares. They must be thankful for its construction, however, in that it had provided an airy thoroughfare and had given character to the city. The city authorities and the land and property owners might unite to make Birmingham what it ought to be. He suggested improvements between Paradise-street and Five Ways, and on land between the Prince of Wales Theatre and Easy-row, in the neighbourhood of the Crescent, he saw a site for the new Cathedral,

clergy house, and other public buildings. Easy communication could be obtained between the centre of the city and Bordesley by a continuation of New-street.—The Lord Mayor and General Phelps, who were present, spoke in appreciation of the paper, and a vote of thanks was passed to Mr. Henman.

LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.—At the rooms of this Society on Thursday, the 25th ult., Mr. Maurice B. Adams read a paper on "Public Libraries, their Building and Equipment: A Plea for State Aid." Mr. C. B. Bulmer, President, presided. The lecturer said that this was a paper mainly dealing with the requirements of to-day, and therefore, by way of introduction, there need be no hesitation in his claiming their indulgence if he emphasised the importance of a comprehensive, not to say a liberal-minded, survey of the whole question of library legislation, presenting as the subject did one of the serious problems of our time. Retrospectively the story concerning the origin of libraries and their subsequent history abounded in incidents of the utmost interest. The earliest libraries known were the famous "Record Office" at Kouyunjik, founded more than twenty-five centuries ago, and the library of the great temple at Nippur, discovered four years ago by Dr. Peters, of New York, carried back Babylonian civilisation to 7,000 B.C., though no document was found at Nippur of later date than 2280 B.C.; and the great library of Pergamon, founded 200 B.C., which contained 200,000 volumes. Prior to entering upon any discussion about the special arrangement of library buildings, it would be convenient briefly to allude to the subject of library provision in its wider aspect. This reference brought them face to face with the stern realities of what was called the "penny rate," which had been fixed more than fifty years ago, but, as the law now stood, any town could by special Act of Parliament augment its penny rate for library purposes, and twenty-eight boroughs, with satisfactory results, had done so. It required little imagination to realise what a direful struggle to make ends meet in many a small town must be experienced with only a penny rate, and in most places the attempt was practically impossible. If in fairly large towns the penny rate was not enough, the whole thing in villages became preposterous, and the lecturer thought that the Board of Education should have powers to include library enterprise when making grants for educational purposes. The system of State aid for libraries obtained in Canada, Australia, South Africa, and the United States. The Central Library at Boston, U.S.A., cost 473,000*l.* and contained 800,000 books, with ten branch libraries besides, averaging 20,000 volumes each. The yearly cost of maintenance was 52,000*l.*, out of which the city purse provided 47,000*l.* They now came to the initial question in the planning of a public library, as to the respective proportion of space which should be allowed to the different departments in allocating the available superficial area. A roomy and even spacious entrance-hall was essential. According to the usually accepted *régime* in proportioning the floor area of a library with a closed lending department, the following allocation of space for every 10,000 ft. superficial had been recommended, viz., 3,000 sq. ft. for newspapers, 2,000 sq. ft. for magazines, 2,000 sq. ft. for the reference department, leaving 3,000 sq. ft. for the lending library. With regard to the position of the librarian's room, he thought it ought always to be next the reference-room and close to the lending library. [A full reprint of this paper will be found in the R.I.B.A. *Journal* of the 25th ult.]

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—A meeting of this Society was held on Thursday last week in the Society's rooms, Leopold-street, Sheffield, Mr. T. Winder, President, in the chair. A lecture on the "Curvilinear Period of Gothic Architecture" was given by Mr. Mitchell-Withers, who briefly enumerated the terms under which this period was known by different writers, such as "late decorated," "the flowing period," but considered that Sharpe's term of "curvilinear period," dating from 1315 to 1360, was the most satisfactory. After a brief historical note of the political state of England at that time, and of the impoverishment of the country by the wars which had preceded this period, he referred to the variation of type that was found necessary to meet the needs of the people in the new churches that were erected, and showed how the best illustration of this occurred in parish churches. The ground plan of the building, he stated, was marked rather by the convenience and extra spaciousness obtained, especially in the naves of the churches, than by any departure from the general arrangements of the preceding geometrical period. He dealt next with the nave arcades, stating that the spaces between the piers were wider than hitherto, and that the piers themselves were often lighter and usually placed diagonally with the axis of the church, while the triforium was often entirely omitted and in other cases was of much less importance, being usually then treated as a continuation of the clerestory which became a much more important feature in the period. Leaving the interior for further detailed consideration, he proceeded to speak of the exterior of the buildings, pointing out the variations that were in progress through the altered requirements of the age and the greater attention that was being paid to the external design. The base of the building was started with a fine moulded plinth continuing round the buttresses, which were pronounced, with a tendency to increased projection. After referring to the towers and spires with their graceful lines, he returned to the interior of the buildings and referred to the roofs, showing how the wood roof permitted much greater lightness in the general structure than stone vaulting where it was employed. After dealing with both these forms of covering for a church, the lecturer proceeded to speak of the various internal details, and showed many beautiful slides of these, and of the elaborate work in stone screens, sedilias, and other accessories. In conclusion, Mr. Mitchell-Withers suggested that the work of this period was worthy of study, whatever style of English architecture one might admire most, because its workers brought knowledge, science, and constructive skill into the work, besides ornamenting it with a mass of refined detail in which the skill of the workman had full scope. On the motion of Mr. C. M. Hadfield, seconded by Mr. T. R. Wigfull, and supported by the President, a vote of thanks was accorded the lecturer. The lecture was illustrated by lantern slides.

BRISTOL SOCIETY OF ARCHITECTS.—On Monday last, the 27th ult., Messrs. A. W. S. Cross, M.A., and George Hubbard, F.S.A., members of the Council of the Royal Institute of British Architects, visited Bristol and read papers before the local allied Society on "Registration." After the papers a full discussion ensued, and a resolution was proposed, seconded, and carried unanimously—"That this Society, having heard the respective papers of Professor Beresford Pite on one side and of Messrs. Cross and Hubbard on the other, is distinctly in favour of the principle of the statutory qualification and registration of architects."

LIVERPOOL ARCHITECTURAL SOCIETY.—The President and Council of this Society held a reception among members at the Law Library on Monday. There were present 150 members and friends, who were received by the President, Mr. P. C. Thicknesse, and Mrs. Thicknesse, and welcomed by many members of the Council. The drawings of the Cathedral (which were lent for the occasion by Mr. G. Gilbert Scott and Mr. Bodley) were on view. A lecture was then delivered in the Library of the Law Society by the Rev. T. W. M. Lund on "The Classical Architecture and Sculpture of Rome," illustrated by limelight views from photographs. Much of the lecture was devoted to some examples of sculpture in the Vatican and to the latest researches in the Forum.

COMPETITIONS.

NEW INFIRMARY, ALNWICK.—In this competition, which was confined to architects practising in Northumberland and Durham, the assessor, Mr. F. Caws, F.R.I.B.A., awarded the first premium of 100*l.* to Mr. Douglas (Alnwick) and Messrs. Boyd & Groves (Newcastle), as joint architects; the second premium of 30*l.* was divided between Mr. Stephen Piper and Messrs. Armstrong & Wright (all of Newcastle).

LIBRARIES FOR ISLINGTON.—The Public Libraries Committee of Islington Borough Council issued the following report on Wednesday:—"The President of the Royal Institute of British Architects, whom we appointed, with the Council's approval, architectural adviser and assessor on November 18, 1904, has selected, partly from his own knowledge and partly from a list forwarded to him by direction of the Committee, the ten architects whose names are submitted as being specially qualified to prepare designs for the Central Library, and we have appointed them accordingly upon conditions as to competition which have been drawn up by the assessor, and which will, we trust, result in the erection of a building worthy alike of the donor and of the borough. Mr. R. Blomfield, Mr. W. Flockhart, Mr. H. T. Hare, Mr. M. E. Macartney, Mr. P. A. Robson, Mr. A. W. S. Cross, Mr. S. K. Greenslade, Mr. A. Keen, Professor Beresford Pite, and Mr. L. A. Stokes." The unsuccessful competitors, except those appointed architects for the branch libraries, are to receive an honorarium of 20*l.* each.

BOOKS RECEIVED.

STEAM-PIPES: THEIR DESIGN AND CONSTRUCTION. By W. H. Booth. (Archibald Constable & Co. 5s.)

GAS AND OIL ENGINES. By Walter C Runciman. (Percival Marshall & Co. 6d.)

ESTIMATING FOR BUILDERS' WORK. Edited by Paul N. Hasluck. (Cassell & Co. 6d.)

MEASURING BUILDERS' WORK. Edited by Paul N. Hasluck. (Cassell & Co. 6d.)

ARCHITECTURE EAST AND WEST. By R. Phenè Spiers, F.S.A., F.R.I.B.A. (B. T. Batsford. 12s. 6d.)

Correspondence.

SEWER VENTILATION AND INTERCEPTORS.

SIR,—I have been much interested in the controversy on the subject of sewer ventilation and interceptors which has appeared in your journal of late; more so because the ultimate issue is of such vital importance as to effect—if not directly, indirectly—the health of the community at large, and, as a custodian of such, I cannot refrain from expressing disapprobation at the unqualified statements made by Mr. E. Van Putten (Borough Engineer of Lewisham) upon the matter, which do not, so far, justify the attitude taken up by him. One need not hesitate to accuse him of being illogical, because his arguments have a tendency to condemn the principles he advocates, and, in order to disperse the misapprehension which must exist in the minds of many of your readers, I trust that Mr. Van Putten will not fail to elucidate in a later issue of your journal his statements in support of this "hashed up" idea of ventilating sewers by converting ventilating pipes of house drains into conduits for sewer gas at the expense of abolishing intercepting traps, a system contrary to the notions of all sanitarians, and which should be strenuously opposed. To abolish the intercepting trap—

> 'Twixt the noisesome parish sewer
> And the humble household ewer—

would mean the undermining of the basis of sanitary progress, of which we boast in regard to the construction of house drains.

Do I understand that the problem of sewer ventilation has become so desperate in Lewisham, and so baffled human ingenuity, as to render it necessary to adopt as a last resource the system put forward by Mr. Van Putten? If so, one can have no doubt as to the result; it must spell failure, if his statement is correct that drain air is more foul than sewer air, because his difficulty will be intensified, instead of being modified, should the ventilators fail to act.

By the way, Mr. Van Putten does not say how he arrives at such a conclusion. Is it not generally accepted that there is a vast difference between "drain air" of a properly-constructed drain and "sewer air" (gas)? I think so, inasmuch as drain air may be regarded as effluvia given off from adhesions of fæcal matter to the interior of the drain pipe, and sewer air, as air mingled with sewer gas generated from deposits of foul matter in the sewer.

It may be clearly established that if the sewers of the town were constructed with adequate self-cleansing falls, with a sufficient number of manholes, efficient flushing arrangements, and free discharge for sewage at the outfall, there would be little need for sewer ventilation, as the sewer would be free from foul matter to create sewer gas. But unfortunately too many sluggish sewers exist, and unless they receive constant attention they become an intolerable nuisance, to say nothing of detriment to health. Although it is absolutely impossible, owing to the gaseous productions of decomposition, to prevent the formation of gas in sewers so constructed, the

nuisance and danger to the individual inhabitant may be mitigated by cutting off sewer gas from the dwelling-house. Thus the intercepting trap is an absolute necessity, more especially so in view of the fact that, in a vast number of instances, drains pass under the house; moreover, to abolish the interceptor would be running the "gamut to goosedom," as the health of thousands of people would be at the mercy of the "jerry builder" and "botch plumber," not only on account of bad drainage, but defective sanitary fittings and scamped plumber's work.

To return to the statements of Mr. Van Putten, he says that "it only remains to show that there would be no damage to the individual inhabitants by the omission of the interceptor from the house drains." He apparently evades the question with studied indifference, without giving an opinion, or attempting to prove that no danger is likely to accrue. As I have endeavoured to point out, there is an imminent danger, because it is difficult to disassociate house drains from sewers; thus it would be foolish to connect the drain ventilator with the sewer; defects may arise, and as sewer gas is poisonous, no question of the dilution of the poison by admixture with air can possibly come into consideration. The only sensible plan of treating noxious gas must be to destroy it locally where it is generated; if that cannot be done it should be dispersed at a high level above the house tops, by independent ventilating pipes.

I may say that during my holidays last year in the city of Hereford, I was interested in experiments which have been made there with Webb's patent street lamps, for extracting and consuming sewer gas, which appeared to give splendid results, and I was assured by my friend, Mr. Sydney Protheroe (the chief sanitary inspector), that wherever these lamps are fixed in the city, the nuisance caused by the emission of sewer gas has ceased in the vicinity.

I have one other point to refer to. Mr. Van Putten, in support of his contention, referred to certain experiments conducted by the Sanitary Institute in connexion with the flushing of house drains. His account is of a one-sided character. The fact is that experiments were made (as you are probably aware) with a view of ascertaining the quantity of water necessary for the efficient flushing of a water-closet. Mr. Van Putten mentions the results obtained only with a 2-gallon flush cistern, which answers his purpose; but, in his anxiety, he inadvertently omits to mention the results obtained with the 2½-gallons and 3-gallons flush, which have a contrary tendency to his quotation.

It is apparent that at present Mr. Van Putten has failed to support his contentions.

FRANK WHITE, R.P.C., A.R.S.I., etc.,
Chief Inspector.

Public Health Office,
County Borough of Northampton.

SIR,—Referring to Mr. Watkins' letter in your last issue, I can quite believe that there is a great deal in what he says about the spread of typhoid fever in Lincoln being facilitated by the absence of sewer-gas interceptors in the drains of some of the houses.

For anyone who has constant experience of the unsatisfactory positions in which soil and drain ventilation pipes are allowed to terminate, and the imperfect jointing frequently discovered between water-closet traps and soil pipes, to say nothing of badly-constructed soil and ventilation pipes and other faulty details of house sanitation, it appears the height of folly to suggest that sewer-gas interceptors should be abolished, and the sewers allowed to ventilate through the house drains.

The only circumstances in which such a system might be permissible would be its universal application, combined with *perfect* drains and sanitary fittings in every house. A partial application under existing conditions must be, in my opinion, highly dangerous.

HENRY CARTER, A.M.Inst.C.E.

LEEDS INSTITUTE OF SCIENCE, ART, AND LITERATURE.—The students attending the classes in building construction, held at the Leeds Institute, spent a very interesting afternoon last Saturday, on a visit to the new building now being erected in South-parade, Leeds, for the Phœnix Fire Office. By the courtesy of the architect, Mr. W. H. Thorp, the whole of the building was thrown open for the students, who, under the guidance of their teacher, Mr. James Neill, made an instructive tour of the structure. These building construction classes are held on Monday, Wednesday, and Friday evenings throughout the session (from September to May), and number at present 176 students.

The Student's Column.

TYPICAL STRUCTURES IN CONCRETE STEEL.—IX.

AN OMNIBUS REPAIR AND ACCUMULATOR DEPÔT. (*Continued*).

IN view of their satisfactory performance, some further particulars relative to the design of the floors in the building described last week may be of interest.

It is stated that M. Monmerque, the engineer who conducted the tests, was somewhat surprised by the records obtained, not so much because the floors successfully withstood the heavy loading, as for the reason that their behaviour with regard to flexure was not in accordance with his preconceived views. M. Monmerque was not prepared at first to accept the theory that either floor would behave as a single structure, and believed that the panels would act more or less as separate beams or slabs. Fig. 59 is a diagram representing the three panels of the 9·14-metre by 7·60-metre floor shown in Fig. 52, p. 214, and, concerning this, the suggestion of M. Monmerque was that the rectangles ABEH, HEKI, and IKML would act independently. In that case the diagram of bending moments for the span AB (Fig. 59) would be approximately as shown in Fig. 61.

The designer of the floors, however, contended that this theory was wrong, and that the rectangle ABML (Fig. 59 or Fig. 60) must be considered in its entirety, arguing that the four surfaces HBEI, HKMI, AEHK, and IEKL in Fig. 60 would work together. As a matter of fact, this is what happened during the official test.

The manner in which the floor behaved will be more readily appreciated by reference to Fig. 62, where PR is the horizontal, below which, and parallel with it, is a line at the distance t, and above it two other parallel lines, one at the distance r and the other at the distance s, the latter being situated at twice the height of r above the horizontal line PR. At the full load of 3,500 kilogrammes per square metre, the point a, at the left-hand support, rested upon the line PR (see Fig. 62, and also refer to Fig. 60 for the position of the point a on the floor surface). The point b rose above the horizontal, at the distance r; the point c descended below the horizontal to the distance t; the point d rose above the horizontal to the distance s $(= 2r)$; the point e descended below the horizontal to t; the point h rose to r; and thepoint i, at the right-hand support, remained upon the line PR.

Hence, instead of being deflected under the

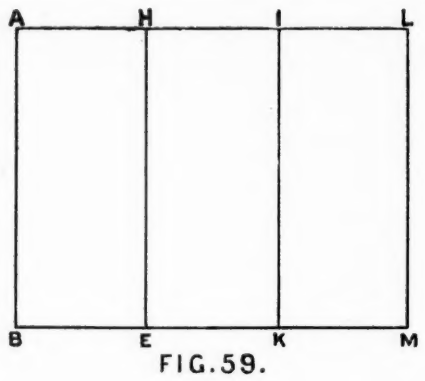


FIG. 59.

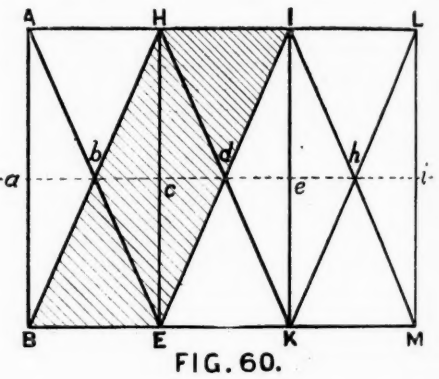


FIG. 60.

FIG. 61.

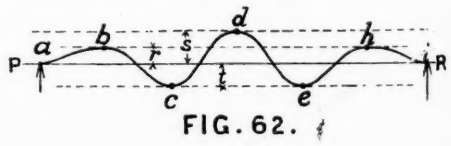


FIG. 62.

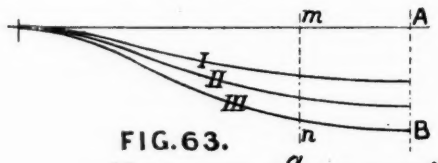


FIG. 63.

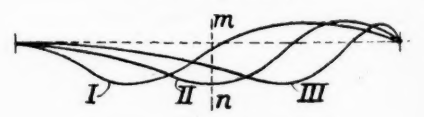


FIG. 64.

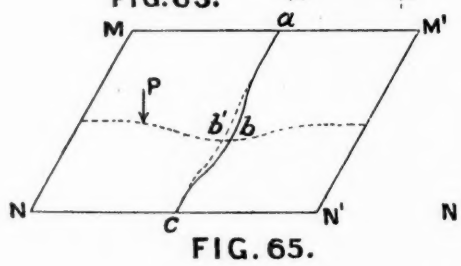


FIG. 65.

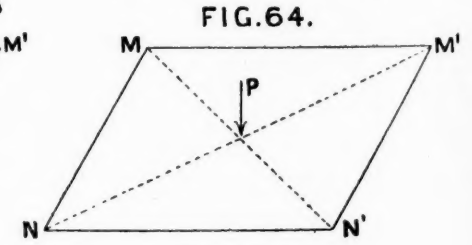


FIG. 66.

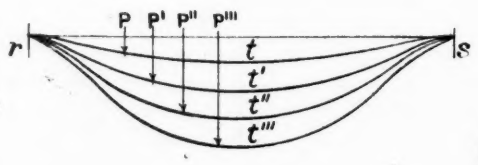


FIG. 67.

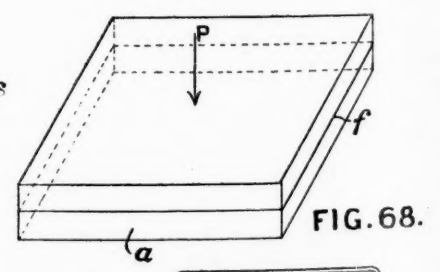


FIG. 68.

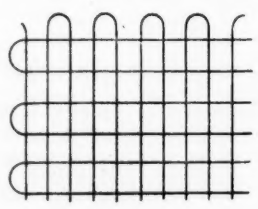


FIG. 69.

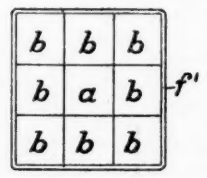


FIG. 70.

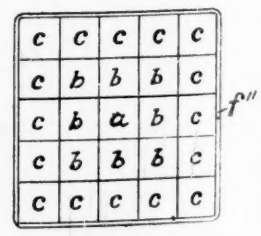


FIG. 71.

Illustrations to Student's Column.

load, *b* and *h* were raised, and *d* was raised to a height double that of *b* and *h* above the horizontal. This result seems quite reasonable, for, *c* and *e* in the members HE and IK (Fig. 60) having dropped, it follows in accordance with the laws of equilibrium that *b* and *d* and *h* and *d* must rise. Further, as *d* is raised by an effort double the value of that acting upon *b* and *h* respectively, *d* is raised to twice the height to which *h* and *d* are raised.

Analogous action is observable in connexion with the construction of lock and dock gates, which, whether made of timber or of steel, consist of plane vertical surfaces, stiffened by bracing, consisting of projecting ribs, and are proportioned in accordance with the rule that the maximum pressure occurs at one-third of the height, such gates being made in pairs, meeting at the middle of the opening to be closed. It has been found that when the bracing possess a certain resistance, this resistance causes variation of the bending moments between the point of maximum thrust and the top of the gate, although the maximum thrust is always exercised at the same point. This view is illustrated by the case of a bridge girder, where the maximum bending moment is not necessarily to be found at the point of maximum load. It follows that the resistance of the horizontal stiffening ribs can be ascertained with reference to the vertical plates or planks of a gate, so that the maximum effort at any point whatever shall always produce a maximum bending moment at the upper part of the gate and on the centre line between the vertical walls of the gateway. It is evident that under a static load the character of the bending moment is not changed and the most favourable conditions of resistance are thereby ensured, because the various parts of the structure are not alternately in tension and compression, as in the case of a bridge subject to rolling loads. If the maximum bending moment of a dock gate occurred normally at one-third of the height, it would be displaced with the increase of pressure, giving rise to conditions similar to those graphically represented in Fig. 64. Upon the section *mn* in this diagram there is compression on I and tension in II and III, whereas in the case represented by Fig. 63 the maximum bending moment is at AB, and the points of the curves I. II. and III in the section *mn* are always in tension.

In the floor system now under consideration the stiffening ribs—corresponding with the bracing of a dock gate—are proportioned to the resistance with reference to the floor slab—corresponding to the planking or steel-plates of the dock gate—so that the bending moment is always maximum at a point such as *b*, at the centre of *ac*, in the surface MN*cba* (Fig. 65). But we may take a surface M′N′*cba*, intimately connected with the surface MN*cba*, and arranged so that the surface M′N′*cba* shall be able to transmit the maximum bending moment at *b* at the centre of *abc*. Then a force P, acting in a downward direction at the centre of the surface MNN′M′ will not be able to depress the line *ac*, as shown by the line *abc*, and the line *ac* will follow the modified direction *a′bc*, because the surface M′N′*cba* offers resistance to the sinking of the point *b* in the surface MN*cba*.

The same line of reasoning can be extended to the ribs MN′, NM′ (Fig. 66), when once the surface has been formed so that the downward force acting along a line as *rs* (Fig. 67), and when acting at any point whatever upon that line, shall still leave the maximum bending moment at the centre. Thus, we have *rts* for the curve of bending moments with the force at P, *rt′s* with the force at P′, *rt″s* with the force at P″, and *rt‴* with the force at P‴. Further, in a floor panel braced by means of stiffening ribs passing from one corner to another (as shown in Fig. 66), any downward force P acting upon any point whatever of the surface MM′N′N will always cause the maximum bending moment due to that force to occur at the point of intersection of the ribs MN′ and M′N.

Hence, it will be seen that the critical points in the floor illustrated in Fig. 60 are *b*, *d*, and *h*, and, as shown in Fig. 62, these points are not depressed as would be the case if the three panels ABHE, HEKI, and IKML were to act separately.

In the case of a floor which, in addition to being provided with stiffening ribs, is reinforced throughout with steel, not only in the form of bars in the ribs, but also constituting a reticulated network—such as that represented in Fig. 69—in the substance of the covering slab, the resistance is far greater than in any floor of ordinary construction, in regard both to flexure and to failure by tension or compression.

Moreover, the effect of the vertical force, applied at any part of the surface, is to cause lateral expansion, resulting in pressure of the mortar or concrete against the strands of steel constituting the reinforcing network. In Fig. 68, *a* represents a prism of mortar or concrete in a floor slab reinforced by a network of steel bars, P the applied force, and *f* the reinforcement surrounding the prism. The effect of binding the prism is similar to, but far less in degree than, that due to the hooping of concrete in column construction as recommended by M. Considère (see the *Builder*, vol. lxxxv., p. 584).

In addition to the restraining influence of the steel rods, the prism *a* is further reinforced by being imprisoned, as shown in Fig. 70, in the middle of a series of eight similar prisms, lettered *b*, each of these being surrounded by a mesh of the network, and the whole series by the hooping *f′*, whose resistance against lateral bulging is increased by connexion with the strands of the network passing between the prisms *a* and *b* in directions perpendicular to every side of the group. Thus the prism *a* experiences from the eight prisms *b* a reaction equal to the action producing lateral expansion, less a diminution proportionate to the elastic deformation of the prism *a*. If the prism *a* were not reinforced laterally in the manner described, it might fail under the force P, whereas, being treated in the manner shown, action is neutralised by reaction, with the result that the prism has merely to withstand stress equal to the difference between the action and the reaction. This difference being equal in value to the elastic deformation of the material, it follows that a great accession of strength must result.

Still further, it must be remembered that this small proportion of the original force P is distributed among the surrounding eight prisms *b*, and in turn the group of nine prisms represented in Fig. 70, when surrounded by other prisms *c*, as in Fig. 71, can only transmit to each of the sixteen prisms *c* a force equivalent to $\frac{1}{32}$nd of the elastic deformation of the prism *a*. It will be observed that the twenty-five prisms in Fig. 71 are hooped by the band *f″*, which is tied laterally by the network, as previously explained. Consequently, the force transmitted to an outer series of prisms is $\frac{1}{64}$th of that on *a*; upon the next outer series the transmitted force becomes $\frac{1}{256}$th; upon the next series the force is $\frac{1}{1024}$th; upon the next series it is $\frac{1}{4096}$th; upon the next series it is $\frac{1}{16384}$th; upon the next series it is $\frac{1}{65536}$th; upon the next series it is $\frac{1}{262144}$th; upon the next series it is $\frac{1}{1048576}$th; and upon the series it is $\frac{1}{4194304}$th.

That is to say, at the distance of ten meshes away from the prism *a* the force is so distributed that it is only about $\frac{1}{4000000}$th of the intensity evidenced at the prism *a*. Of course, only a single downward force P is considered, while in the case of a floor under uniformly distributed load there would be the equivalent of a force P on every prism into which the floor is subdivided by the meshes of the reinforcement. If the dimensions of the floor were represented by a length equal to $a + 10$ prisms on each of two parallel sides of *a*, and a width equal to $a + 10$ prisms on each of the two other parallel sides of *a*, the total force would be represented by P × 441, but this multiplication of the force does not in any way affect the beneficial influence of the system of reinforcement described.

Tests conducted at L'Ecole des Ponts et Chausées and elsewhere have demonstrated the fact that floors constructed in the manner here described, behave as if their outer edges were securely fixed, while at the same time they are merely supported in the ordinary way. The tests conducted at the depôt in the Rue de Lagny appear to show that the different parts of a floor system may be designed so as to balance one another, in accordance with the principles adopted in the construction of arches, domes, and other structures. In such a floor one portion which is depressed under load raises another portion, and, in order to provide against excessive deformation of the surfaces, suitably proportioned stiffening ribs may be employed, so that very heavy loads and considerable spans may be adopted with perfect safety. The depôt of the Compagnie Generale des Omnibus certainly gives striking proof of the capacity possessed by reinforced construction of brick and concrete for complying with the most difficult conditions.

THE RECK SYSTEM OF HEATING BY HOT WATER.

REFERENCE was made in a report in our columns, in November last, to the Reck system of heating by hot water, of which Messrs. James Boyd & Son are the agents in this country. We wrote to them for further particulars, and they have now sent us the accompanying diagram and the following description, which of course must be taken as their statement, not as ours; but we are disposed to think that the claims made for the system will be found to be borne out in practice.

"The Reck circular system of hot-water heating is the invention of Capt. A. B. Reck, of Copenhagen. It is a low-pressure hot-water system, the special feature of which is that all heat is transferred to the water by low-pressure steam in such a manner that the water may be heated to the boiling point in the flow pipes without danger of boiling over from the expansion tank, and, at the same time, the velocity of the water is about four times as great as in an ordinary hot-water apparatus. How this is attained will best be understood by looking at the accompanying diagram of the system.

Steam is here shown taken from a low-pressure steam boiler (E) fitted with an automatic damper regulator, by means of which the pressure may be maintained at any desired point between ordinary atmospheric pressure and about 5 lb. additional. This boiler may be of any type so long as it is capable of generating steam; or, in buildings where high-pressure steam is available, the boiler may be dispensed with, and a reducing valve used to give the required low pressure.

The steam is first taken into the reheater (D), where it heats through metallic surfaces the circulating water coming from the return main (K) and passing through the reheater into the main rising hot-water pipes (L). The metallic surfaces in the reheater are generally made large enough to heat the water in (L) to a temperature of about 185 deg. Fahr., but the admission of steam can be regulated automatically, or by hand, to give any lower temperature.

The pipe (L) ends in the expansion tank (A), but before it reaches this point there are inserted in it two special appliances required by the system—the condenser (C), and the circulator (B), to be described later. These two appliances, however, do not impede the flow of the water through (L) from the reheater to the expansion tank, so if the tank and the reheater are connected by a system of hot-water piping and radiators, through which the water gives out its heat to the building, it will be possible to work such an apparatus at any temperature below 185 deg. Fahr., the reheater replacing the ordinary hot-water boiler in every respect.

In the diagram the main flow pipe (J) of the hot-water apparatus is shown placed in the attic of the building, and the radiators (T) are shown connected to the vertical risers on the one-pipe plan. This is shown only because the one-pipe system is in common use for hot-water heating; any other arrangement of pipes may be used, according to the requirements of the building.

From the steam space of the reheater a steam pipe (G) rises to the attic, where, in the circulator (B), it ends in a noiseless mixing apparatus, for mixing the steam with the water rising through (L). As the circulator is always placed a certain distance below the water-level in the expansion tank, it follows that no steam will enter the circulator as long as its pressure, controlled by the regulator at the boiler, does not exceed the water-pressure in the circulator. Thus it will be seen that a simple movement of the weight on the regulator in the basement gives the attendant means for almost instantly putting the circulator in or out of action, as circumstances may require.

Now, if the steam is allowed to have sufficient pressure to penetrate into the circulator and to mix itself with the water there, the result will be that this water, rising up to the expansion tank, will have a very strong admixture of steam bubbles, making the specific gravity of this part of the water column in the rising pipe less than half the specific gravity of a column of water at boiling point without the admixture of steam. The increased velocity in the hot-water heating apparatus, as soon as steam enters the circulator, is due to this great diminution in specific gravity of the upper part of the column of rising water.

When the water reaches the expansion tank

the steam contained in the bubbles will be discharged from the surface of the water, so that when descending through the hot-water main pipe (J) the water will be once more perfectly free from steam.

The steam discharged from the surface of the water in the expansion tank will reach the condenser (C) through the overflow pipe (H), where it will be reduced to water and returned through a special return pipe (R) to the boiler. The condenser consists of a steam jacket or a series of tubes inserted on the main rising pipe (L). Its condensing surface is sufficient to deal with the steam discharged from the expansion tank, the volume of this steam always being in a certain proportion to the weight of water passing through the hot-water system. To give an outlet for what air is contained in the upper part of the tank, in the overflow pipe, and in the condenser, before steam penetrates the circulator, an automatic air-valve is fixed on the condenser.

The possibility of raising the temperature of the water in the flow mains of a low-pressure hot-water apparatus to the boiling point gives a considerable saving in heating surface without danger of overboiling, and at the same time the increased velocity of the water allows of carrying the heat to very great distances from the boiler and of using pipes of only one-fourth the sectional area required by ordinary low-pressure hot-water heating.

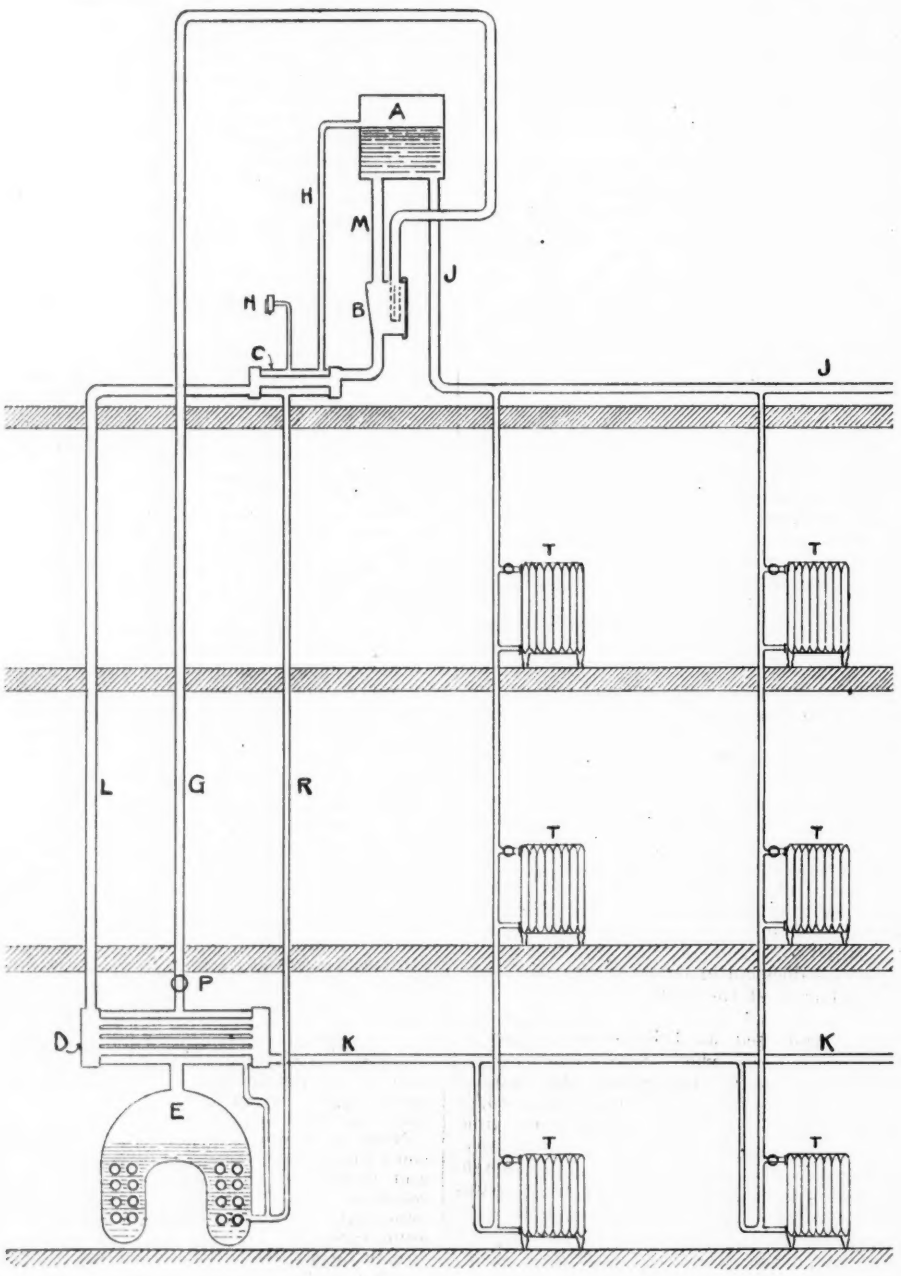
The Reck system is simple to work, as it is self-controlling. It cannot overheat the water, and it regulates the combustion in the boiler automatically, so that no waste of fuel can occur. The whole system is so simple that the management of the apparatus may quite safely be left to unskilled servants.

It is an economical system to work, because it is capable of raising and lowering the heat in a very short time, and can therefore easily adapt itself to the changes of the weather. Containing a smaller body of water, it naturally requires a smaller quantity of fuel to raise the heat and to maintain it than does an ordinary hot-water system.

As all the water produced by the condensation of the steam finds its way back to the boiler, the water line will remain constant without any special feeding apparatus.

The strong circulation produced by the Reck circulator allows the apparatus to be fitted up almost regardless of levels. It is as effective in its work when all the heating surface is on the same level as the boiler, or even lower, as when it is on some higher level. It does away with the necessity for sunk heating chambers—the boiler need not be the lowest part of the system. It makes a heating apparatus more sightly, because it uses smaller pipes. It conveys the heat further and into difficult places.

In conclusion, the Reck system makes it easy to solve problems in heating which have hitherto been considered most difficult, because the effect of the circulator on the motion of the water is practically independent of the levels of the radiating surfaces in relation to the level of the boiler."



Sectional Diagram Illustrating the Reck System of Hot-water Heating.

A—Expansion tank.
B—Circulator.
C—Condenser.
D—Re-heater.
E—Boiler.
G—Steam pipe to circulator.
H—Overflow pipe.
J—Main hot-water flow pipe.
K—Main hot-water return pipe.
L—Main hot-water pipe from re-heater to circulator.
M—Motor pipe.
N—Automatic air-valve.
P—Valve on steam pipe.
R—Condensation pipe.
T—Radiators.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of this Council was held on Thursday last week at the City Hall, Charing Cross-road, S.W.

Loan.—On the recommendation of the Finance Committee it was agreed to apply to the London County Council for an advance of 14,961*l.* for the purpose of certain street improvements and sewer works.

Paving of Streets round Kingsway.—The Works Committee recommended, and it was agreed, that the proposal of the London County Council to pave with asphalte the street east of Kingsway leading from the south side of Lincoln's-inn-fields be approved.

Paving Estimates.—The Works Committee submitted a further report on the annual estimates for paving works, and recommended that the sum of 32,992*l.* be approved. This was agreed to.

London Building Act Amendment Bill.—A letter was received from the Kensington Borough Council enclosing copies of the resolutions passed at the recent conference of local authorities. It was resolved to inform the Borough Council of the steps already taken by the City Council to oppose the Bill.

RURAL HOUSING QUESTION AND THE BY-LAWS.

MR. WALTER LONG, President of the Local Government Board, received a deputation on the 23rd ult., organised by the Workmen's National Housing Council on the subject of rural by-laws. The deputation was introduced by Mr. Robert Williams. It was urged that the enforcement of the existing by-laws was absolutely necessary, and that any modifications with regard to materials and provisions for health, safety, and stability must be safeguarded.

Mr. Robert Williams said that they desired to dissociate themselves entirely from those who decried by-laws and their administration. Acknowledging, as they did, the great need of more and better houses, they desired to do their utmost to further any efforts that were being made to supply the want; but, at the same time, they would not be a party to ill-built, cramped houses, constructed of flimsy materials on the score of cheapness and regardless of sanitary regulations. It was said that the labourer could not pay more than 8*l.* a year; therefore his house must be reduced in cost, so that the 8*l.* rent should give a fair return on the capital laid out. If the labourer were paid 4*l.* more a year he would be able to pay 12*l.* rent. It seemed to them that that was pre-eminently an agitation to keep wages down to their present low level.

Mr. Walter Crane said he thought it was perfectly possible to conform to every healthful regulation and to build in accordance with the Local Government Board regulations cottages that would not disfigure the face of the country.

Mr. Lambert and Mr. Gwynne having also spoken,

Mr. Long, in reply, said that, though the deputation was very interesting, it was really unnecessary. The general principles which it had advocated had always been advocated and maintained by the Local Government Board. So long as the by-laws ensured that cottages should be well built, should be sanitary, and suitable for human habitation, he did not think that anyone had a right to complain. Of the 700 local authorities in England only 266 had adopted even the present moderate by-laws, and the local Government Board would undertake a difficult enterprise if it made the by-laws stricter and then insisted on their adoption. His object in any alterations he would make would be to adapt the by-laws to the requirements of the districts so that they should be adopted by a larger number of local authorities. The real difficulty was to frame by-laws which should be applicable to areas partly urban and partly rural, and he was considering the question of introducing an intermediate code to meet such cases. Bad cottages in the country were often attributed to the neglect of the landowners, but inquiry would reveal that it was not so, and that the bad cottages belonged to small speculators who lived at a distance, and probably never saw the buildings. There was no doubt that the cottages in many places were altogether unsuitable and inadequate, and the Board would do everything possible to remedy this state of things. There was room for great improvement in the administration of the by-laws on the part of local authorities, and the members of the deputation might do useful work by bringing pressure to bear on their representatives on the local bodies to secure a better discharge of their duties.

OBITUARY.

MR. JACKSON.—Mr. John Chappell Jackson, of Wimbledon, and Town Hall-chambers, Borough, S.E., has succumbed to injuries he received by a fall from his bicycle a few days ago. Mr. Jackson was born in 1872, and was a pupil of Mr. Augustus E. Hughes, of Mortimer-street, W. He was employed as architect for the rebuilding or enlargement of many large licensed houses in various parts of London, amongst them being the Black Dog, in Vauxhall-walk, the Bull's Head, in Ben Jonson-road, Stepney, and the Fishmongers' Arms, Wood-green, for Messrs. Watney, Coombe, Reid, & Co.

MR. MORRISON.—The death, on February 11, is announced of Mr. Gabriel James Morrison, M.Inst.C.E., aged 65 years, who, as a pupil, accompanied Lord Kelvin for the laying of the first cable across the Atlantic. We read in the *Times* that, after having been employed as engineer in charge for the since dismantled railway from Shanghai to Wusung, he established himself in practice as a civil engineer at Shanghai, where he played a prominent part in public affairs as member of the Municipal Council and commanding officer of the Volunteer Corps. In 1885 he entered into partnership with Mr. F. M. Gratton, and the firm of Morrison & Gratton carried out many important engineering and architectural works in Shanghai. After the dissolution of partnership, three year ago, Mr. Morrison came to London, and was appointed consulting engineer for the Shanghai-Nanking railway, in association with Sir John Wolfe Barry and Mr. Arthur J. Barry.

MR. WILSON.—The death is also announced of Mr. George Wilson, D.Sc., and A.M.Inst.C.E. Mr. Wilson, who died in his 33rd year, was Lecturer in Civil Engineering at Leeds University, and had previously been Demonstrator in Engineering at Owens College.

MR. GEORGE E. LOWRY.—We have to announce the death of Mr. George Edward Lowry, of the firm of Messrs. J. & W. Lowry, builders and contractors, of Corporation-street, Newcastle, and resident at St. George's-terrace, Jesmond. Mr. Lowry, who was 40 years of age, was a native of Newcastle, and for a very long period he had been connected with the firm, who have carried out some extensive contracts. The most important of late were the erection of the Laing Art Gallery, the rebuilding of the Exchange Hotel, Grey-street, and the Sun Insurance Offices in Collingwood-street, Newcastle. He was well known amongst builders, architects, and contractors of the North of England and other parts of the country. He leaves a widow and one child.

GENERAL BUILDING NEWS.

CHURCH, FIRVALE, SHEFFIELD.—The nave of the new Church of St. Cuthbert's, at Firvale, Sheffield, has just been dedicated by the Bishop of Sheffield. The church is built to accommodate 750 people, and is in the Early English style. Provision has been made for a tower and spire to be raised at the north-west angle. Mr. J. D. Webster was the architect, and Mr. Longden the contractor.

CATHOLIC CHURCH, ASHINGTON, NORTHUMBERLAND.—The corner stone of a new Catholic church has just been blessed by the Right Rev. Abbot, of St. Edmonsbury. The new church, which is situated on the main thoroughfare at the corner of Station-road and Park-road, will be a brick building with Gothic windows and chancel. The nave will be about 78 ft. in length and 32 ft. in width, the edifice being computed to seat fully 500 worshippers. It will be provided with a side chapel and a baptistry. A cloister, 12 ft. wide and 33 ft. long, will connect the church with the presbytery. The architect is Mr. Charles Walker, of Newcastle, the building contractors being Messrs. R. & G. Brown, of Amble. The estimated cost of the undertaking is 2,500*l.*

ECCLESALL CHURCH, NEAR SHEFFIELD.—Mr. Temple Moore, of Hampstead, has prepared plans for the proposed enlargement of Ecclesall Church. The proposed alterations consist of the addition of a large transept and choir, with aisles, to the east of the present building, the existing small chancel recess and east wall of which are to be taken down, and the galleries in the present nave removed. The whole of the seating of the existing part of the church will be renewed, and the organ is to be moved from its present position to a gallery at the north end of the new transept. The style of the new work is to be Early English, local stone being used for the walls, and the new timber roofs to be covered with Westmorland slates.

WESLEYAN CHURCH, CORK.—The opening of a new Wesleyan church, which has been erected at Cork, took place recently. The building has been erected at a cost of 1,450*l.* Accommodation is provided for about 250. The architects were Messrs. Sames & Henshaw. Mr. A. Blain was the contractor for the work, with the following sub-contractors:—Mr. R. Hutton, joinery; Mr. Harrison, Ulverston, plumbing and painting; Mr. J. Chippendale, Grange, plastering and slating.

PARISH ROOM AND VESTRY, IPSWICH.—On the 23rd ult., the new parish room and vestry which have been added to St. Peter's Church, Ipswich, were opened. The vestry consists of a room 23 ft. wide and 25 ft. long, with lavatory accommodation adjoining at one end. The new building is built of red brick, and faced, where seen, with flint and stone dressings; the floor is laid with pitch-pine blocks. The builders were Messrs. E. Catchpole & Sons, the architects being Messrs. Brown & Burgess.

ALTERATIONS TO THE TOWN HALL, FOLKESTONE.—The improvements which are being made to the Folkestone Town Hall are now nearly completed. On entering the main entrance on the left, what was the police court has been curtailed in length and converted into a committee-room, that which used to be on the right having been transformed into other rooms, the office of the Chief Constable occupying the corner, next to it being the Town Sergeant's office, and in rear of it a lavatory. The main staircase of stone (to the large hall) has been transferred to a position behind the committee-room, and it debouches on to a landing formed of a space cut off from the old assembly-room. On the right at the top is the enlarged council chamber, which comprises the former chamber with the space formerly occupied by the top of the staircase. The floor was found, on examination, to be weak, and a new one was constructed. The seating accommodation is augmented by the extension of the balcony, and also by the construction of a gallery at the rear, which covers the space formerly filled with lumber. The gallery is approached by a separate staircase, as is also the balcony, the entrance to the stairway to the latter being from the landing outside the main hall and the council chamber. The police court is a new apartment. At the back of the police court are two cells for prisoners, and on the same floor are magistrates' retiring-room, two consulting-rooms, lavatory, etc. The main door of the police court faces the main door of the building. The police station and offices are situated in the basement, the principal apartment being the police muster-room. There are five cells for prisoners, all built on the same principle as the two above, and lined with brown enamelled bricks. All the principal apartments are floored with wood blocks. The whole building will be warmed by means of a low-pressure system of hot-water apparatus, and radiators are placed in the halls and corridors. Electric light is provided throughout the building. The large hall and gallery, the council chamber, the police court, and cells are ventilated by means of exhaust fans driven by electricity. The wood-block floors have been put in by Messrs. Jeffrey & Son, of London; the mosaic flooring in the entrance by Messrs. Diespeker & Co., of London; the heating and ventilating appliances by Messrs. Jones & Son, London; the electric light installation and fittings by Messrs. G. Smith & Co., Folkestone; and the fireproof floors by Messrs. Banks & Co., of London. The general contractor for the work was Mr. J. G. Parsons, the architect being Mr. Reginald Pope. Mr. Lepper was the clerk of the works.

TOWN DEPOT, ILFORD.—The new depôt at Ilford was opened a short time ago. The buildings have a frontage to Ley-street of about 350 ft., with a building-line set back 15 ft., and are enclosed by a dwarf wall and ornamental wrought-iron fence in panels. The main entrance is from Ley-street, and is about 30 ft. wide, situate between the cottages and the office block. A weighbridge, by Messrs. Pooley & Son, to weigh up to 10 tons, is placed in this entrance, adjoining which is a weigh office and general clerks' office. Leading out from this office, with an entrance from and overlooking the yard, is the foremen's office. In continuation of this block are separate stores for tools, oils, etc. An open shed separates these buildings from the stable block, having a parapet wall to isolate the stables in case of fire. The stable block consists of a fine range of stalls for twenty-four horses, the central portion of which is occupied by two loose boxes, and harness-room, with hay and corn store over, having a fireproof floor, and surmounted by a turret ventilator. Facing Ley-street, but separated from the depôt itself, is a pair of cottages arranged for the use of employees. At the rear of the site, and to the left, are situate the workshops and stores. At the back of this building is an open tar macadam store. The central block comprises a roller-house, with space for two steam rollers, and men's messroom, with cooking range, tables, and seats. Adjacent to this room is a lavatory. The block of buildings to the right of the last comprises an open cart-shed for carts, with two storerooms over, carried at the front on steel stanchions and girders, and having a fireproof floor. Access to these stores is obtained by means of an exterior staircase. Supported upon steel girders and an arched concrete floor above the stores is a cast-iron water tank capable of holding some 40,000 gallons. The premises are electrically lighted throughout. The buildings, on Ley-street frontage, are faced with red bricks, with stone dressings, terra-cotta, etc., whilst at the rear they are faced in stock bricks with blue brick quoins, the whole of the roofs being slated. The cost of the buildings, exclusive of site and all fittings, is about 10,000*l.*, the contractors for the work being Messrs. F. & A. Willmott, of Ilford, the clerk of works being Mr. Samuel Streeter. Mr. H. Shaw, surveyor, prepared the plans.

REBUILDING IN HIGH-STREET, KENSINGTON.—The old shops, houses, and back streets on the north side of the high road, for a length of about 200 yds. eastwards from Church-street, have been pulled down for a widening of the roadway from 43 ft. to 60 ft. On a portion of the cleared ground a block of buildings is being erected for Messrs. Barker, after plans and designs by Mr. P. E. Pilditch, the architect of several premises built for that firm in the immediate vicinity. The new buildings, constructed of red brick, with Portland stone dressings, have a frontage of 80 ft. to the High-street, with a return of about 160 ft. in the side street formed by the widening of Brown's-buildings; the block, seven stories high, contains shops and showrooms on the ground and first floors, and suites of residential flats on the floors above. New shops are being erected on the Church-street side, of the same materials and after a similar elevation; a fire brigade station is at the end of the new side street; and eastwards, near the gates of Palace-gardens, is a large space which has been acquired by the Crown.

ST. HILDA'S CHURCH, WEST JESMOND.—St. Hilda's Church, West Jesmond, has just been consecrated. The new church is Early XVth century in style, and is built of stone from the Brunton Quarries. The roofs are covered with Westmorland green slates, and are constructed of pitch-pine. The main roof over the nave and chancel runs at the same level from east to west. At the junction of nave and chancel there is an octagonal turret, with spire covered with oak shingles. The bell is hung in a stone turret adjoining the Sunday school. The aisle roof is of the open timber description. The chancel pavement and that to entrance porch is of black and white vitreous glass mosaic. The chancel stalls are of oak, also the pulpit, Litany desk, altar table, and credence. The font is of Caen stone, and the lectern of brass. The plan of the church consists of nave, chancel, north aisle, vestries, and organ chamber. The south aisle has yet to be built, and when completed the church will seat 500 adults. The heating is by hot water on the low-pressure system. The lighting will be by electricity. The following firms have been employed on the building:—Mr. F. J. Hepple, builder; Messrs. Emley & Sons, heating engineers; Messrs. Falconer, Cross, & Co., electrical engineers; Messrs. Rusts Vitreous Mosaic Company, for pavements; the North of England School Furnishing Company, for chancel stalls; Messrs. Brown & Hughes, for pulpit and Litany desk. Messrs. Hicks & Charlewood are the architects. The cost of the present church is over 4,000*l.*

SANITARY AND ENGINEERING NEWS

SEWAGE OF DITCHLING.—The Chailey Rural District Council have received sanction from the Local Government Board to a loan of 6,250*l.* for the sewerage and sewage disposal of the parish of Ditchling, and the engineers, Messrs. Beesley, Son, & Nichols, have been instructed to prepare the necessary plans and specifications to enable the Council to invite tenders for the construction of the works.

THE VENTILATION OF SEWERS.—Mr. Dudfield, the Medical Officer of Health for the Borough of Kensington, in his monthly report, says, in relation to the subject of foul air from sewers:—"Attempts have been made at sundry times to provide a chemical remedy for the nuisance. One such—successful as a laboratory experiment—was tried in Kensington some thirty-six years ago. Others have formed the subjects of patents; not one of which has come into general use, a fairly sure indication of their practical inutility. The late Metropolitan Board of Works and the County Council alike, expended vast sums on disinfectants with the same object, to little purpose. My own view has always been, that abatement of nuisance from this cause, should be sought by means for admitting to the sewers copious streams of atmospheric air."

REGISTRATION OF PLUMBERS.—The Corporation of Grimsby is to be congratulated on having taken a forward step in the sanitary administration of the Borough by requiring that the plumbers employed upon Corporation work shall possess the Registered Plumber's Certificate. This decision follows logically and usefully upon the establishment of the National Registration of Plumbers by the Plumbers' Company in the chief centres of population. The late Mr. George Godwin was one of the most prominent of those who induced and assisted the Company to organise the registration system. Reference to the *Builder* of the period affords evidence of the soundness of their views, which have since been generally adopted.

MANCHESTER SHIP CANAL.—The Engineer's report as to works states that the depth of water in the canal and docks has been fully maintained throughout the entire length of the waterway by means of the dredging operations. The embankments and slopes of the canal are generally in good condition, and the works throughout have been efficiently maintained. At Partington Coal Basin two additional hoists, with the necessary railway approaches thereto, are in course of construction. A new power station for the supply of hydraulic power to these hoists is also in process of construction. The leading jetty at the upper end of the 65-ft. lock at Irlam is well advanced towards completion. A cattle stage with approaches has been constructed on the northerly side of the canal at Barton, and is in use. The erection of the coaling crane at the new berth at Weaste has been completed, and the crane is in use. Additional railway sidings at Barton, Weaste, and Trafford Wharf have been completed, and are in use. The leading jetty on the southerly side of the 65-ft. lock at Mode Wheel is in course of construction, and is nearly complete. The works in connexion with the new dock on the site of the old racecourse, and with the transit sheds on the southerly side thereof, which are being carried out by Mr. Henry Lovatt, and others, under contracts with the Manchester Dock and Warehouse Extension Company, are approaching completion. The removal of the length of the dock wall, which has formed the dam between the existing docks and the new dock, is in progress. A locomotive shed to the southward, and an electric switch-house to the eastward of No. 9 Dock, are in course of erection. The works required for the deepening of the length of the canal between Latchford Locks and Irlam Locks are in progress. The construction of works required in order to permit of the raising of the level of the water in the estuary section of the canal is being put in hand.

FOREIGN.

FRANCE.—M. Lenoir, the sculptor of the monuments to Berlioz and César Franck, has been commissioned by the Government to carry out a monument to Prud'hon, the painter, which is to be erected in the Jardin de l'Infante at the Louvre.——The French Society of Water-colour Painters has opened its exhibition at the Georges Petit Gallery. Among the best works are those of MM. Guillaume, Scott, Latouche, Calbet, and Zuber.——M. Besnard and M. Alfred Boucher have been elected members of the Conseil Supérieur de l'Enseignement des Beaux-Arts.——The Municipality of Auch have voted a sum of a million francs for architectural and street improvements.——The municipality of Brest has under consideration the building of a school for young naval officers.——The jury in the competition for a new Savings Bank for Toulon have awarded the first premium to M. Jean Milloz; but the carrying out of the building is given to M. Gillet.——M. Billon has been elected President for 1905 of the Union Architecturale of Lyons.——The Municipality of Grasse has voted a sum of 1,200,000 francs to improvements in the sanitation of the town.——The death is announced, at the age of 67, of M. José Ramon Llopis, architect. He was a native of Valence, and studied in the Atelier Guénepin and at the Ecole des Beaux-Arts. He was successively employed, in 1864, at the works of the Exhibition, then at those of the Vaudeville Theatre, and finally at the Trocadéro. He was architect of many private buildings. He was a member, since 1871, of the Société Centrale des Architectes.

GERMANY.—In the competition for designs for a bank at Darmstadt, the first premium (2,000 marks) was awarded to Herr Paul Meissner, and the second (2,500 marks) was divided between Herr Klass v. Mack and Herr Vetterlein.——An exhibition, entitled "Art in the Country Districts," is being held at the Art Museum in Berlin.——The building in connexion with the Technical School at Berlin, designed by Dr. Thür, and built at a cost of 120,000 marks, is now being used for an exhibition of "German Chemical Industry."——The Market Hall at Cologne, built by Herr Schilling, and which is now in use, cost 6 million marks.——The gymnasium and girls' school, built from the designs of Herr Heidsiek, at Lübeck, are completed.——The Church of the Holy Ghost at Berlin will be preserved, but it is to be connected with the new commercial schools, and the interior is to be used as a Lecture Hall.——An Exhibition of Japanese Decorative Art is to be held in the Art Museum of Berlin; the collection is chiefly the property of Herr Gustav Jacoby.——The Church of St. Michaels at Hildesheim, which dates from the XIth century, is to be restored.

AUSTRIA.—A monument to the Emperor Josef is to be unveiled in August at Dux; the monument is to stand at the entrance of the Park, and is being executed by Professor Gerhard.——The building of the Landstrasse Theatre in Vienna has been entrusted to the architects, Franz Freiherr von Kraus and Herr Josef Tölk.

SWITZERLAND.—Some interesting frescoes have been discovered on the walls of the church at Goldbach, which, according to Professor Künstler, date from the IXth and Xth centuries.——A new secondary boys' school is to be built at Bern, for which the Town Council has voted 930,000 francs.——The death is announced of Herr Franz Allemann, civil engineer, at Bern, on February 3, in his 67th year.——A concert hall is being built at St. Gallen from plans by Herr J. Kunkler; the hall is to be completed by the end of the summer.——The church at Würenlingen is to be restored under the direction of Herr Betschon.——New Government buildings are to be erected at Bern at a cost of 600,000 francs.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENT.—Mr. Alfred Griffin has arranged a partnership, as from the 27th ult., with Mr. Benjamin Woollard, F.R.I.B.A., who has hitherto practised at No. 16, Finsbury-circus, and the joint practice will be conducted at Mr. Griffin's offices, 34, Coleman-street, E.C., under the style of "Griffin & Woollard."

CHURCH OF ST. PETER, GREAT WINDMILL-STREET.—The Bishop of London has appointed a commission to consider, and to report upon, the expediency of pulling down the Church of St. Peter, in view of the diminution of the resident population. St. Peter's was erected after plans and designs, in the Decorated style, of R. Brandon, and consecrated on June 12, 1861, the organ being by Gray & Davidson. There are 700 sittings, and the patronage vests in the rector of St. James's, Piccadilly. The site, on the east side of Great Windmill-street, adjoins that of the Argyll dancing-rooms (formerly the tennis court of Piccadilly Hall), since rebuilt as the Trocadero Restaurant.

MEMORIAL TO LORD WILLOUGHBY DE BROKE, KINETON, GLOUCESTERSHIRE.—The memorial raised to the memory of the late Lord Willoughby de Broke by his relations and the members of the Warwickshire Hunt has now been completed in St. Peter's Church, Kineton. It consists of a reredos, chancel screen, organ case and panelling in oak. The reredos consists of a triple canopy of vaulted woodwork, crowned by small pinnacles and cresting, in the Jacobean style, in keeping with the altar and sanctuary chairs. On each side of the reredos and round the sanctuary is panelling in three rows, of which the two lower are a variety of the linen pattern. The organ case is a complete work of itself, of Renaissance design. At the bottom it is divided into three panels, of which one at the side forms a door, while the two centre ones form a sliding cover to the keyboard. Above is a beam carrying brackets ornamented with the heads of cherubims, and these carry the pipes, and from them run up light pillars surmounted by crowns and joined by scroll-work. The chancel screen is divided into seven compartments, consisting of arches of Renaissance tracery to match the reredos, and carrying a frieze which is surmounted by a cross and an arcade of three arches, over the centre one being a broken gable. The lower parts of the screen consist of solid panelling. The whole is carried out in Austrian oak, fumed and waxed to a dark colour, and has been designed by Mr. John Belcher, A.R.A. The work has been executed by Mr. Garbie, of Aberdeen.

"THE MUNICIPAL YEAR BOOK."—"The Municipal Year Book of the United Kingdom for 1905," edited by Mr. R. Donald, and issued by Edward Lloyd, Ltd., Salisbury-square, E.C., shows an increase in size in comparison with the last issue. The present edition has been revised, additions have been made to the various sections, and new information has been introduced. A brief review is given of the work of each local authority in alphabetical order, under the name of the city, town, or district, and statistics for general comparative purposes can easily be obtained. The eighteen sections of the book are in the following order:—(1) London Municipal Government (County Council, City Corporation, Borough Councils, Water Board, Asylums Board, etc., etc.), (2) Municipal Government in England and Wales, (3) Municipal Government in Scotland, (4) Local Government in Ireland, (5) Water Supply, (6) Gas Supply, (7) Tramways, (8) Electricity Supply, (9) Housing of the Working Classes, (10) Markets, (11) Telephones, (12) Baths and Wash-houses, (13) Education, (14) Libraries, (15) Cemeteries, (16) Refuse and Sewage Disposal, (17) Local Taxation Returns, (18) Municipal Trading. There is also a directory of the principal societies and organisations connected with the various branches of local government. We have tested the book in various ways, and have found it a well-arranged and reliable work.

SALE OF ART BOOKS.—Messrs. Lawrie's joint collection of art books, consisting of 111 lots, was sold for 1,043*l.* 6s. at Christie's rooms last week. The chief items included the following:—History of the Works of Sir Joshua Reynolds, 1899-1901, A. Graves & W. V. Cronin, 62*l.*; two copies of John Smith's Catalogue Raisonné of the Works of the most Eminent Dutch, Flemish, and French Painters, 38*l.*; J. Chaloner Smith's British Mezzotinto Portraits, 1884, an illustrated edition, 38*l.*; Lodge's Portraits, proofs on India paper, in six volumes, 24*l.*; Sir E. J. Poynter's National Gallery, 1899-1900, and L. Cust's National Portrait Gallery, 1901-2, five volumes, 22*l.*; Sir Walter Armstrong's Gainsborough and his Place in Art, 1898, 11*l.*, and his Sir Henry Raeburn, 1901, 5 guineas; Galerie du Palais Royal, with upwards of 350 highly-finished engravings by J. Couchée, 1781-1808, 20*l.*; W. Bode & C. H. de Groot's Complete Works of Rembrandt, Paris, 1897-1902, 50*l.*; and Sir Joshua Reynolds's Works, 500 mezzotint engravings by S. W. Reynolds and others, five volumes, 78*l.* Amongst other lots were Christie's Sale Catalogues of many celebrated collections, such as the Pender, Magniac, Hope, and others, and a set, in seventy-three volumes, of French Picture Sale Catalogues, 1767-1896, 39*l.*

TEE-SQUARES AND SET-SQUARES.—Messrs. Longmans, the well-known publishers, who seem to have taken a certain class of drawing-instruments as a speciality, send some tee-squares on Professor Low's patent model. We have before referred to the set-squares, which are made with a thin coating of celluloid on each face, which, while it is easy to keep clean, keeps the actual drawing edge of the square away from contact with the paper, and thus lessens the liability to blots from an overful pen. They now send us a series of tee-squares made on the same principle, which has the same advantages as in the set-squares. They look very neat and clean, and will probably pick up less dirt and dust than a plain wooden blade, and the prices are not high: but the wood blade which forms the foundation for the celluloid face is not quite thick enough, or else is not hard enough wood, to ensure the stiffness desirable in a tee-square. The makers had better alter this even at the cost of raising the price a little: a tee-square of which the blade is at all elastic will not recommend itself in the long run, however neat and clean is its finish. The makers have also produced some extra large set-squares, 17 in. on the longest side, which are most useful: and these are thick and substantial, and will work well. Messrs. Longmans send us also a sample of the "Vector" set-square, a very useful instrument. This is a set-square with most of the area next the hypothenuse cut out—*i.e.*, it has only two ruling sides, the vertical and the horizontal, and in the angle between them is fixed a flat circular brass hinge to which is attached a movable arm which can set at any angle desired within the limits of the vertical and horizontal limbs, and can thus supply parallel lines at various angles; a thing often required in plan-drawing.

BUNGALOWS AND BUILDING BY-LAWS.—A letter has been sent by the Local Government Board to the Rural Council of Hayfield, in the Peak district of Derbyshire. In the Peak district of Derbyshire, many citizens of Sheffield and Manchester have erected residences of the bungalow type, and some of these do not conform in some respects to the requirements of the local by-laws. Quite recently, cases of the kind have occurred in the Hayfield district, and the District Council have written to the Local Government Board, asking to be given discretionary powers as regards the application

of the by-laws—which are only of recent compilation—to buildings of an exceptional character. The letter from the Local Government Board was as follows:—"The Board are aware of the observations of the Court in the case of Salt *v.* Scott Hall, to which you have referred them. Although there may be individual cases in which a dispensing power might occasionally be thought useful, the Board feel that the reservation to local authorities of a general power of relaxing the provisions of their by-laws at will would not improbably lead to difficulties more serious than those which the absence of such power produces; and it is, therefore, contrary to their practice to allow clauses giving such a power. The proper course for the District Council to adopt would seem to be to consider the modification or division of the existing by-laws, and, so far as the Board are aware, this could be done without entailing material expense beyond that of printing. A copy of a clause, which has been adopted by some local authorities, exempting small dwelling-houses, subject to certain conditions as to size and position, from the operation of the by-laws with respect to the structure of walls, is enclosed herewith, and I am to suggest that the Council's object might, to some extent, be met by the adoption of a by-law based on this clause. The Board, however, are of opinion that the Council would be well advised to consider whether some more general relaxation of the requirements of the by-laws in force might not with advantage be made. The Council might make a series, based on the rural model, with respect to new buildings, and certain matters in connexion with new buildings of which copies are enclosed. This series could be supplemented, if need be, by some provisions with respect to new streets and the structure of walls, etc., for securing stability and the prevention of fire derived from the urban model as to new streets and buildings of which copies are also enclosed. The Board will be prepared to consider any proposal which the Rural District Council may make with a view to framing by-laws more suitable to the district than the by-laws at present in force. It would be open to the Council to frame different series for the urban and rural portions of the district, provided those portions could be clearly defined so that the series in force in any particular place could be easily ascertained from the by-laws by any person interested. The Board requests that any proposals of the Council may be submitted on the model forms for their preliminary approval before any steps are taken with a view to the formal adoption of the by-laws, and it would be of assistance to the Board if the draft by-laws were submitted in duplicate."

WILLIAMSON PARK, LANCASTER.—At the meeting, on February 22, of the Lancaster Town Council, it was announced that Lord Ashton had undertaken to supplement his recent munificent gifts to the town by an offer to defray the further expense (from 5,000*l.* to 6,000*l.*) of improving and beautifying Williamson Park by the erection of a pavilion and palmhouse, a bandstand, and other ornamental accessories, for which Mr. Belcher, A.R.A., has prepared the plans and designs. In November, last year, Lord Ashton agreed to expend a minimum amount of 50,000*l.* upon new municipal buildings at Lancaster, to take over and maintain the present town hall for the benefit of the town, and to give from 25,000*l.* to 30,000*l.* for the buildings in the park, together with 2,000*l.* as endowment.

ACCIDENT INSURANCE OFFICES, NORWICH.—Messrs. Mark Fawcett & Co. ask us to mention that the fire-resisting floors in this building, illustrated in our last issue, are on their system.

BRITISH FIRE PREVENTION COMMITTEE.—The Report No. 91 of this Committee, just issued, records the result of tests for resistance to fire of the electro-glazed casements of the Luxfer Prism Syndicate. It is satisfactory to find that this very neat-looking system of glazing, in which the metal joinings of the panes are much thinner than can be attained with leaded lights, proved quite efficient against fire. The fire test lasted three-quarters of an hour, attaining a temperature of 1,500 deg. Fahr. The following is the summary of result in the Committee's Report:—"The squares of electro-glazing in each of the lights commenced to crack immediately after the gas was lit and other squares continued cracking during the test. In fifteen minutes the glazing in the two teak frames commenced bulging, one (No. 1) towards the fire, and the other (No. 3) from the fire; this bulging increased during the test from ¼ in. (·0063 m.) to ½ in. (·0127 m.). The teak frame (No. 1) which was set nearly flush on the fire side was burning freely; the burning subsequently decreased but was renewed in twenty-one minutes. In forty minutes the teak transom of this frame was aglow on the side away from the fire. The glass was not displaced from its electro-glazing in any of the lights. On the application of water at forty-five minutes, the whole of the glazing was covered with small hair cracks, presenting a frosted appearance, but was not displaced. There were indications that fire had passed between the glazing and the wood frames. The fire did not pass through the glazing."

ARTISANS', LABOURERS', AND GENERAL DWELLINGS COMPANY.—The thirty-eighth annual report of the Company gives the details of their London properties as follows:—Shaftesbury Park, Battersea, 42½ acres; thirty shops, 1,135 single houses, thirty-three double houses (two tenants each), and one block of twenty-two tenements; rental for the year, 29,274*l.* 9s. 5d., being an increase of 208*l.* 1s. 5d. Queen's Park, Harrow-road, 76 acres; 116 shops, 2,071 single houses, 108 double houses (two tenants each), and a public hall; rental for the year, 66,501*l.* 12s. 10d., being an increase of 424*l.* 8s. 5d. Noel Park, Wood Green, N., 100 acres; eighty-five shops, 1,226 single houses, and 225 double houses (two tenants each), covering more than half the area; rental for the year, 31,534*l.* 19s. 11d., being an increase of 733*l.* 5s. 11d. During 1904, 150 single houses and fifty-one double houses have been completed, and a large number of these have been let. Besides these, 110 single houses were commenced, and will be completed during 1905. It is proposed to commence 174 single houses during 1905. Leigham Court, Streatham, S.W., 66 acres; thirty-three shops, eighteen flats, 355 houses, and 530 maisonnettes. Besides these, forty-one houses are finished or structurally complete, and will be ready for occupation during 1905. Rental for the year, 24,742*l.* 7s. 6d., being a decrease of 151*l.* 12s. 4d. It is proposed during 1905 to erect a few houses at the Streatham High-road end of Downton-avenue should the demand for houses increase. Block buildings, rental for the year, 34,313*l.* 15s. 1d., being a decrease of 199*l.* 9s. 5d., owing to shops at Lisson-grove remaining vacant during part of the year. Mr. H. B. Measures, having been selected by the Secretary of State for War as the Director of Barrack Construction, has resigned the position of the Company's architect, which he had filled for fourteen years. Mr. G. J. Earle, who has been confidentially associated with Sir Richard Farrant for the past eleven years in the management of the Company, has been appointed to the position of surveyor, with superintendence of the architectural staff, and it has therefore not been deemed necessary to fill in any other way the vacancy caused by Mr. Measures' resignation.

PROPOSED SEWAGE WORKS, TAUNTON.—Colonel A. J. Hepper, D.S.O., R.E., an Inspector of the Local Government Board, held an inquiry at the Municipal Buildings, Taunton, on the 21st ult., concerning an application by the Taunton Town Council for sanction to borrow a further sum of 10,000*l.* for the purpose of sewerage and sewage disposal works. The Town Clerk (Mr. G. H. Kite) explained the reasons for the application, and described in detail the history of the sewage works, ending with the adoption of the septic tank system. Through the construction of the new works the cost of working had been reduced from 800*l.* a year in 1899 to 470*l.* last year. Mr. Arthur J. Martin, A.M.Inst.C.E., of Westminster, a member of the firm of Messrs. Cameron, Commin, & Martin, engineers to the Septic Tank Syndicate, and Mr. G. R. Richardson, C.E., gave evidence, after which the inquiry closed.

A BRADFORD ARBITRATION.—Mr. J. J. Wright sat, on the 20th ult., as arbitrator in a High Court action, brought by Messrs. A. & C. Darnes, masons and builders, of 71, Derby-road, Thornbury, against Messrs. A. & W. Duckett, stone merchants, of Wensley Bank, Thornton-road, Thornton, to recover a sum of 179*l.* 11s. 5d., the balance due upon the building of twenty-nine dwelling-houses at Woodhall-terrace, Thornbury. The hearing of the arbitration proceedings took place at the Talbot Hotel, Bradford. Mr. Henry Waddington represented the plaintiffs, and Mr. A. V. Hammond the defendants. The plaintiffs, it was shown, entered into a contract for the building of the houses in question. The terms of the contract were three times altered, and eventually an agreement was come to that the masons' and bricklayers' work should be completed for the sum of 2,420*l.*, the houses to be finished in every respect like the first seven houses, counting from the south end of the same street, not exclusive of the end house. The plaintiffs alleged that in the performance of the contract extra work to the extent of 90*l.* 0s. 7d. was executed, either to comply with requirements of the Bradford Corporation or of special instructions of the defendants themselves. The defendants had, it was contended, paid in cash or in material a sum of 2,330*l.* 9s. 1½d., and there was a balance claimed by the plaintiffs of 179*l.* 11s. 5d. The defendants, for their part, contended that the work done and claimed for as extras ought to be included in the contract price, and they denied that there was any balance owing. They counter-claimed for 25*l.*, of which 16*l.* 9s. 3d. was special damages on particular items. The arbitrator went in detail into the various matters in dispute, and will give his award in the usual way.—*Yorkshire Observer.*

WAR MEMORIAL, PERTH.—The Black Watch Memorial in St. John's (East Parish) Church, Perth, has been unveiled by the Duke of Atholl, K.T. The memorial is made of copper. The design is a wreath of laurels and thistles entwined with a ribbon on which is inscribed the names of twenty-four battles. The thistle blooms are made of yellow and green cairngorms, amethysts, Ayrshire jaspers, and other Scottish pebbles. On the two top corners are two badges of the regiment, the Order of St. Andrew, and the Sphinx of Egypt, enamelled in colour on silver, and in the bottom corners are the old numbers of the first and second battalions of the Black Watch, 42 and 73. The centre plate is made of three sheets of copper with names of 209 officers, non-commissioned officers, and men chased in raised letters; while at the bottom are two figures of an officer and man in full arms. The memorial is the work of Mr. J. M. Talbot, Edinburgh.

THE CHAPEL, CARISBROOKE CASTLE.—The Bishop of Southwark, on behalf of the committee, appeals for contributions in aid of the equipment and decoration of the interior of the Chapel of St. Nicholas, and thereby to complete the reinstatement of the fabric for uses of public worship. The scheme of restoration was propounded five years ago by way of a non-political memorial to King Charles I. The reparation was entrusted to the superintendence and directions of Mr. Percy Stone, who has now completed all the structural work, the porch excepted. The King has presented the organ, reading-desk, and candlesticks formerly used in Queen Victoria's private chapel at Osborne House; the east window and a screen for the ante-chapel are amongst the objects which the committee desire to supply.

DUNSTAFFNAGE CASTLE.—The Duke of Argyll, Keeper of Dunstaffnage Castle, has opened a fund for the repair and maintenance as a local museum of the castle buildings. In a recess of the wall on the right hand of one entering the passage that leads into the great courtyard was formerly kept the Lia Fail, or Stone of Destiny, which, so runs the tale, Fergus brought from Tara, and Kenneth II., first King of All Scotland, removed to Scone in or about A.D. 850. Edward I. was crowned King o' Scots on the stone which he conveyed to Westminster Abbey. A description, with a plan, of the present remains of Dunstaffnage, will be found in the *Builder* of November 1, 1902.

THE PEABODY FUND.—The fortieth annual report of the Governors of the Peabody Donation Fund states that the capital expenditure on land and buildings to the end of the year was 1,407,339*l.* 11s. 11d. The whole of the repairs, amounting to 13,331*l.* 12s. 10d., have been charged to income as formerly. The erection of the eighty-two cottages at the Herne Hill Estate, referred to in the last report, has been completed. Owing to the scarcity of applications the weekly rents have been reduced from 9s. 3d. to 8s. per cottage, exclusive of the charge for rates. At the end of the year the Governors had provided for the artisan and labouring poor of London 12,328 rooms, including those occupied by the superintendents and porters, besides bath-rooms, laundries, and lavatories. These rooms comprised 5,469 separate dwellings, viz., eighty-two cottages of five rooms, 101 tenements of four rooms, 1,828 of three rooms, 2,572 of two rooms, and 886 of one room. During the year the Governors have made a small additional purchase of about three-quarters of an acre of land fronting the site at Lordship-lane, Tottenham, making a total area of 5 acres. The average weekly earnings of the head of each family in residence at the close of the year was 1*l.* 1s. 6d. The average rent of each dwelling was 4s. 3¾d. a week, and of each room 1s. 11d. in respect of those estates where the rates are paid direct to the local authorities by the tenants. In the cases in which the Governors still pay the rates, the average rent of each dwelling, including the rates, was 5s. 3d., and of each room, 2s. 4d. The rent in all cases includes the free use of water, laundries, sculleries, and bathrooms. The mean population during the year was 19,313, showing a density, after taking into account the occupied portion only of the Herne Hill site, of 635 people to the acre, or over ten times that of London.

Legal.

ACTION BY WOOD-PAVING CONTRACTORS AGAINST THE BRIGHTON CORPORATION.

THE hearing of the case of Macartney, McElroy, & Co. *v.* the Brighton Corporation concluded in the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 17th inst., on the application of the defendants for judgment or alternatively for a new trial of the action which was heard before Mr. Justice Grantham and a special jury in the King's Bench Division.

Mr. Fletcher Moulton, K.C., Mr. Boxall, K.C., and Mr. C. C. Scott appeared for the appellants, and Mr. Montague Lush, K.C., Mr. Cautley, and Mr. Moss Blundell for the respondents.

Mr. Moulton, in opening the case, said the action was brought by the plaintiffs, a firm of wood-paving contractors, in respect of a contract for paving in connexion with the electric tramway scheme of the Brighton Corporation. The action was tried before Mr. Justice Grantham and a special jury, and the judgment, so far as the principal part of it was concerned, was a judgment for the rectification of the contract in question. The ground for the present application was that there was no evidence whatever to go to the jury in support of the plaintiffs' case, and the defendants asked, on various other grounds, for a new trial. Counsel, proceeding, said that while the tramways were being constructed the Corporation thought it would be a good time for paving certain of the streets, and two specifications were prepared, one by the tramways engineer, and the other by the Borough Surveyor. Tenders were invited, and the plaintiffs were the persons selected to do the work. The judgment, as he had said, was really one of rectification of the contract on the ground that the parties did not intend to enter into the contract as drawn up, but mutually intended to enter into another contract whereby the plaintiffs were to receive a much larger sum for the work. To justify rectification of a contract, the mistake, the learned counsel argued, must be mutual, but in this case his submission was that the only contract that the Corporation intended to enter into was that which was in fact signed by the parties. If the Corporation were right in their contention on the point of rectification, it would be unnecessary to trouble the Court with other matters raised by the case. The plaintiffs claimed that there was a mistake in the price that they named, and that they omitted to allow for the excavating and concrete work, and they therefore said that the sum named in the contract ought to be increased so as to cover the cost of this work. On the other hand, the Corporation alleged that the contract was for a lump sum for the whole of the work. At the trial the jury found that the lump sum was too small owing to an error by something over 14,000*l.*, and the learned judge held that the intention of both parties was to make a contract whereby the plaintiffs were to be paid, in addition to the sum named in the contract, the whole cost of the excavating and concrete work.

Lord Justice Mathew asked whether the plaintiffs were not entitled to a reasonable sum in respect of the work the cost of which they said was omitted from their figures.

Mr. Moulton said that the only way the plaintiffs could succeed on their claim was by showing that there was a mutual mistake. The contract in question was with a local authority acting under the Public Health Act, and it was given under the seal of the Corporation in accordance with section 174 of that Act, which required that all contracts for sums above 50*l.* should be given under seal. The learned counsel, having dealt with the evidence in detail, said that the burden was upon the plaintiffs of showing that the contract which was signed was not the contract which both parties intended. He submitted it was impossible to show that the Corporation intended to enter into an agreement under which they were to pay, in addition to the lump sum, a sum of 14,000*l.* The only contract which was in the minds of the Corporation was the one which was in fact signed, and no other. He contended that, the contract being under seal, it could not be rectified unless there was something clearly identifying the intention otherwise than that expressed in the contract. He submitted there was no such evidence, and, as a matter of law, there could be no rectification.

Mr. Boxall followed on the same side.

In the result it was stated that the parties had agreed to terms, and judgment was entered for an agreed amount to end the litigation.

The terms of the settlement were not mentioned in Court.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

27,259 of 1904.—A STRAUSS: *Method of Producing or Constructing Concrete Piles or Foundations.*

A method of producing or constructing concrete piles of great supporting capacity, consisting in temporarily lining the hole (previously bored) by means of a pipe, and introducing the concrete therein, then ramming down said concrete and causing same to spread below the pipe lining according to the nature of the surrounding earth, and subsequently raising said lining ready for a further charge of concrete to be rammed down, the process being repeated until the pile or foundation is completed.

27,372 of 1904.—H. WESTPHAL: *Construction of Ceilings or Floors and Bricks or Tiles for Use Therein.*

A ceiling brick or tile, provided with a lateral projection or lateral projections, and at the ends with bevels or grooves on the upper and lower edges only, so arranged that, when a number of such bricks or tiles are properly assembled to form a ceiling or floor, the recesses formed above the lateral projections are in free communication with the recesses formed by the lower end baffles or grooves.

27,857 of 1904.—M. GERSTER, F. FREUND, S. FREUND, and T. IMRE: *Manufacture of Bricks from Magnesite.*

A process for making artificial bricks of magnesite by calcining the raw magnesite and grinding the calcined magnesite, after which the ground product is formed into bricks or blocks and again fired, partially effecting the alteration of volume of the magnesite during the first calcination of from 30 to 50 per cent. by mechanical means, partly in order to save fuel, and partly to facilitate the grinding of the calcined magnesite, the firing of the pressed blocks taking place in the ordinary manner.

28,244 of 1904.—G. PAPE: *Cramps and the like for Joiners' Use.*

A glue-press actuated by toggle action, comprising a plurality of superposed cramps, each cramp being pivoted to that beneath, so that on swinging the cramp above on its pivot the pressing jaws of the cramp beneath are moved towards each other so as to press together the boards being glued.

28,837 of 1904.—R. B. HUGUNIN: *Sash Fasteners.*

This consists in the combination with a sash lock having a face plate and locking-tongue lever pivoted thereto, operated by hand and spring pressure, the locking-tongue lever plate provided on each side near the upper end with concave hooked-formed pivotal-bearing surfaces, embracing, on the rear side, more than the vertical or longitudinal halves of the pivots employed in connexion therewith, to prevent the disconnexion of the pivotal parts through the workings of the lock.

6537 of 1904.—E. C. RANSOME: *Concrete-Mixing Machinery.*

This invention relates to that type of mixers known as batch mixers, in which the material to be mixed is placed into the mixer a batch or charge at a time, and is in like manner discharged when mixed. The mixer consists of a rotary drum or shell fitted with a plurality of bafflers and mounted to rotate on a pair of rollers carried by a horizontal shaft, one of the rollers being fast and the other loose on the shaft. The drum is rotated from the shaft by means of a gear-wheel on the drum meshing with a pinion on the shaft.

27,177 of 1904.—F. SCHAUB: *Building Stones.*

Building stones made of plaster, gypsum, or the like, distinguished by having channels or borings closed at one end formed in them for the purpose of reducing the weight and the stopping of sound, such stones being also formed with grooves and tongues corresponding to one another so that a good binding together of the stones may be obtained at small cost of cement.

28,289 of 1904.—G. J. HONE and THE THAMES IRONWORKS SHIPBUILDING AND ENGINEERING COMPANY, LTD.: *Grabs.*

A grab, consisting in the use of discharging gear, comprising one or more pawls hinged to the sheave block, a balance weight acting in conjunction with each of the pawls, and also hinged to the sheave block, one or more notches or recesses in the pin attached to the sliding cross-head, and a fixed stop for each of the balance weights.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made

2,158 of 1904.—W. M. DUCKER: *Portable Houses.*

A portable house having its sides and ends formed of primarily constructed sliding sections of uniform width, and abutting edge-to-edge, the upright members of said sections having each a longitudinal groove, a tongue therein, which serves to exclude the air, and locking means mounted in said upright members for drawing together the sections.

2,445 of 1904.—C. OBREBOWICZ: *Arrangement for Increasing the Circulation in Hot and Warm Water Heating Apparatus.*

An arrangement for increasing the circulating power in hot, warm, or steam heated water heating installations as well as for obtaining the desired temperature of the water conducted to the radiators, characterised by the arrangement of a water superheater, of a pipe carried upwards from said superheater, a pipe for the water that does not pass through the superheater of the usual expansion tank, and of a device such as an injector or like, consisting of two principal parts, one the motor, the nozzle of the injector operated by the superheated water, or by the steam given off from same, or by the mixture of steam and water which is conducted to the motor part from the superheater through the ascending pipe, whilst the superheater is fed by a part of the water flowing to or from the heating installation, and a second part, the suction part, for example, the suction chamber of the injector sucking the "circumfluous" water, so that it intimately mixes with the superheated water, said mixture being then forced on towards the radiators, whereby the circulating force of the heating installation is considerably increased, although the temperature of the mixture may be maintained considerably under 100 deg. C.

2,619 of 1904.—C. H. T. BRINK: *Means for Assembling School Benches, and other Pieces of Furniture, and Raising Them as a Whole from the Floor.*

This invention has for its object means for uniting all the school benches and desks of a classroom in such a manner that by the intermediary of a suitably-arranged windlass they may be raised from the floor, so as to facilitate the cleaning of this latter. A row of benches is formed by a number of benches and desks, standing one behind the other. They are connected together by means of the sills fastened to them at the foot of the side boards. Each row of benches can be raised by means of a set of pulleys. By this practice a greater number of pulleys would be necessary to raise several rows; the sills may therefore be connected together at their ends by transoms, so as to make several rows of benches into a suspendable whole.

2,714 of 1904.—G. W. BEECH: *Door and Window Fasteners.*

A construction of fastener for doors or hinged windows, consisting of an ordinary hinge-like appliance so constructed that the hinge-pin is movable and has a rib or ribs which can be caused to engage with grooves or slots in the lugs of one or both members of the fastener for locking same.

2,903 of 1904.—H. J. MARKS: *Arrangement of Window Sashes and Parts Connected Therewith.*

This invention relates to a manner of opening and holding window sashes in angle positions particularly applicable for ventilating rooms, and also offers facilities for turning the outside of a window sash to the inside of a room for cleaning. According to this invention a bar or rod is affixed to stile or rail of a bottom sash by an eye or loop, and hinged or pivoted by an eye or loop jointed to a bracket fixed to the stile of the top sash, either centrally or above or below the centre of both stiles of a top sash; or the bar or rod can be fixed by an eye or loop jointed to a bracket affixed to the stile of the top and bottom sashes, either centrally or above or below the stiles of top and bottom sashes. The bottom sashes, and, in some cases, the said bar may be arranged and held at the back of the stiles of top and bottom sashes. The bottom rail of bottom sash is hinged to silling of window to admit of the sash opening in an outward direction, or the bottom ends of sash may be pivoted to jambs of window frame for same purpose.

5,514 of 1904.—W. NICHOLSON and G. CHAPMAN: *Wood Blocks for Flooring and like purposes.*

This relates to wood blocks for flooring and like purposes, consisting in the provision of a dovetailed groove cut in the centre of the material as it passes through a moulding or like machine, leaving the outermost edges or portions to act as seats for bedding down on to the cement or like composition.

7,156 of 1904.—A. ILLIDGE: *Construction of Lock and Latch Cases.*

A lock or latch case of which either the cap or back plate or both the plates is or are put in place by being slipped endways into longitudinal grooves formed in the rim, and is or are securely retained in place by means of the fore-end.

8,008 of 1904.—R. R. MAIN and J. J. CAMERON: *Vertical or Pale Fencing.*

Vertical or pale fencing, composed of corrugated upright pales slit and creased to reverse the corrugations on opposite sides of such slits, and notched horizontal bars having tongues adapted to enter the funnel like channels or pockets formed by the corrugated and slit pales.

15,337 of 1904.—W. S. HARKUS and J. E. HOULGATE: *Adaptable Window Blind Roller with Simplified Check-action Fittings.*

An improvement on Patent No. 27,782 of 1903, viz., an endless cord running in an ordinary pulley-wheel either with or without a rubber bed and a spindle, which wheel falls into an open eye in a bracket. Upon the bed of the wheel the endless cord is impressed and held in position by a spring. The apex of the spring is held in place on the bracket plate with a pin. Two other guide-pins are used for keeping it in tension on the cord when in operation either in pulling up or down.

16,631 of 1904.—H. SCHNEIDER: *Floors.*

A process for making floors, characterised by two grates having longitudinally-running rods of iron or similar material, provided with longitudinal ribs or flanges, and jointed together by means of rods of iron or similar material running vertically and in zigzag course, into which artificial stone or hewn natural stones of the shape of double pyramids with concave or conical angular sides are inserted, whereupon the space left between them is filled up with cement, which forms, after being dried out, a rigid support column.

26,486 of 1904.—W. T. MITCHELLI: *Window Fastening.*

This consists in the combination of a tongue pivoted near one end in a bracket fixed in a recess in the pulley style of a window frame, a window sash having wedge-shaped recesses to receive said tongue, the tongue being chambered to receive a key or tumbler, a spindle for operating said key, and a thumbpiece upon the end of the spindle.

28,316 of 1904.—E. A. J. HOOPER: *Ash Guards and Ash-pan Fronts.*

An ash guard or ash-pan front, consisting in elevating the lower edge from the hearth through the medium of feet, knobs, or other lifts formed integral with or attached to the said guard or front or to certain of the sections or panels of a flexible guard or front.

28,357 of 1904.—F. I. LUMLEY: *Fastener or Grip for Linoleum or Wood Mouldings or the like.*

This invention relates to the construction of a fastener or grip that can be used to fix linoleum to floors or mouldings to woodwork or such like purposes, and consists of a small metal plate, of a thickness corresponding to the strength required, with part of the edges cut away or slit at a suitable angle from the edges so as to leave V-shaped points at the edges; these points are then turned, some up and others down, at right angles to the metal plate. The points can be formed out of any part of the flat plate by stamping them, some up and others down, at right angles to the flat plate, but if the points are made on the edges of the plate to the number of six points—that is, three turned up and three turned down—the three points on either side, being in position triangular or nearly so, it will be found the fastener or grip will lie more readily in position for fixing. The points can be made of various lengths, according to the holding power required of them, and can also vary in the number of points and the position of them on each fastener or grip.

28,488 of 1904.—L. C. RUGEN and H. ABRAHAM: *Flexible Roofing and Flooring.*

A process of manufacturing a flexible material, which consists in impregnating a suitable fabric with a hydrocarbon mixture and then applying to the foundation thus formed, and while the hydrocarbon mixture is soft and plastic, a coloured facing, consisting of a pigment and a mixture of a resinous body with a "feed" body, such facing being applied in a heated plastic condition so a to cause said coating to interlock with the foundation.

28,580 of 1904.—K. JAVAY: *Compound Concrete and Iron or Steel Structures for Floors, Roofs, and Bridges.*

Compound concrete and iron or steel structures for floors, roofs, and bridges, consisting of a concrete arch, on the underside of which are transverse straight ribs in which are embedded straight tie plates or grips of tie rods, the ends of which are made to constitute anchors embedded in the concrete.

28,584 of 1904.—F. CAMBEMALE: *A Process and Contrivance for the Purification of the Air of Workshops, Living-rooms, and other places.*

A process and contrivance for the purification of the atmosphere of workshops, living-rooms, and other places, characterised by a casing, a cylinder, or any other similar arrangement having at one of its ends the entrance opening, and at the other opening for escape, and between these two openings, a series of partitions alternately incomplete, and by preference suitably perforated and provided with a thin layer of wadding of cotton, flax, or any other fibrous and stringy material which has been rendered non-ignitable, through which the air to be purified filters on coming out through a slot or stove or by being forced into it by means of a ventilator.

29,135 of 1904.—D. W. ADAMS: *Fireproof Curtains.*

A fireproof curtain, composed of a series of slats, each of which, except the lowermost one, is provided on its front side with separate strips having raised portions containing guide slots, and each of which slats, except the uppermost one, is provided on its rear side with bolts which interlock with the slotted strips of the slat next above it.

29,256 of 1904.—S. VON MROKOWSKI: *Floors of Buildings.*

Means for the ventilation of wooden floors, consisting of boards furnished underneath with grooves or passages, the ends of which boards are separated by a small space from the wall, and a skirting is rabeted or otherwise formed so as to provide passages which communicate with the said grooves of the boards, one of said skirting passages being provided with an inlet communicating with the interior of the room or with the outer air, and the passage of the outside skirting being formed with an outlet opening into a chamber or stove, the inlet being placed at the farthest point from the outlet.

29,350 of 1904.—T. WEISSER: *Locks for Doors and the like.*

A lock adapted to be used for right or left hand and as a rim or cupboard or mortice lock, having a tumbler carrying a star or the like, formed with three heads, each serving as a latch or bolt for a particular purpose, the said star being rotatably attached to the tumbler by a screw, and adapted to be fixed by a screw on said tumbler so that either the head serving as a lifting latch, or either of the other tapered heads serving as right and left sliding bolts respectively, may be made to project through the side of the case.

18,804 of 1904.—C. W. BRUNSON.—*A Composition of Matter for Artificial Stone.*

A composition of matter for artificial stone, consisting of cinders or other coarse insoluble material 35 lb., sand 15 lb., barytes ½ lb., cement 2 lb., and water sufficient to make a thick slush.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

February 15.—By BUNCH & DUKE.

Clapton.—1, 5, and 7, Clifden-rd., u.t. 69 yrs., g.r. 15*l.*, y.r. 84*l.*	£840
17, Clifden-rd., u.t. 59½ yrs., g.r. 5*l.*, y.r. 39*l.*	275

By ERNEST OWERS.

Hampton, Middlesex.—1 to 16, Station-rd., u.t. 94 yrs., g.r. 89*l.*, w.r. 369*l.* 4s.	1,700
Hampstead.—97, Alexandra-rd., u.t. 53 yrs., g.r. 15*l.*, e.r. 100*l.*	850

By RUSHWORTH & STEVENS.

Regent's Park.—4, Queen's Mews, u.t. 40 yrs., g.r. 1*l.* 11s., y.r. 25*l.*	180
Clerkenwell.—17, River-st., u.t. 7¼ yrs., g.r. 8*l.*, y.r. 50*l.* 10s.	120
58 and 59, Amwell-st., u.t. 7¼ yrs., g.r. 13*l.*, y.r. 97*l.*	245
Norwood.—4, The Av., u.t. 32 yrs., g.r. 2*l.* 1s., p.	600
Camden Town.—102, Park-st. (s.), y.r. 68*l.*	1,155
Ventnor, Isle of Wight.—High-st., f.g.r. 10*l.*, reversion in 955 yrs.	255

By DOUGLAS YOUNG & CO.

West Ham.—Baxter-rd., etc., f.g. rents 55*l.*, reversion in 76 yrs.	1,100
Battersea.—8, Auckland-rd., u.t. 76 yrs., g.r. 7*l.*, w.r. 36*l.* 8s.	300
Brixton.—77, Akerman-rd., u.t. 58½ yrs., g.r. 8*l.*, y.r. 55*l.*	450
Clapham.—96 and 98, Sandmere-rd., u.t. 65 yrs., g.r. 17*l.* 10s., y.r. 87*l.*	810
Enfield.—Bush Hill-pk., 6, Second-av., u.t. 48 yrs., g.r. 4*l.* 10s., e.r. 32*l.*	230

February 16.—By H. J. BLISS & SONS.

Shoreditch.—49, 51, and 53, Austin-st. (s.), f., y.r. 117*l.* 18s.	980
Walthamstow.—32 to 38 (even), Summit-rd., f., w.r. 83*l.* 4s.	760

By BRIANT & SON.

Tooting.—Broadway, "The Lodge," with land adjoining, f., p.	2,000

By CHESTERTON & SONS.

Kensington.—19 to 27, St. Alban's-rd., f., w.r. 1,000*l.*	£9,000

By J. C. PLATT.

Fulham.—Ancill-st., f.g. rents 86*l.* 2s., reversion in 60 yrs.	2,145
44 to 104 (even), Ancill-st., u.t. 62½ yrs., g.r. 51*l.*, w.r. 808*l.* 12s.	5,100
Greyhound-rd., f.g. rents 123*l.*, reversion in 60 yrs.	3,305
Greyhound-rd., "Prince of Wales Hotel," etc., f.g.r. 12*l.*, reversion in 60 yrs.	700
Greyhound-rd., "Colton Arms" b.h., f.g.r. 8*l.*, reversion in 48 yrs.	220
Greyhound-rd., f.g. rents 30*l.* 16s., reversion in 48, 52, and 67 yrs.	1,025
62 and 64, Greyhound-rd., f., y.r. 80*l.* 4s.	1,125
87 to 97 (odd), Greyhound-rd., f., w.r. 216*l.* 14s.	2,705
Greyhound-rd., freehold building land, area 0 a. 0 r. 38 p.	605
Margravine-rd., f.g.r. 11*l.* 14s., reversion in 60 yrs.	410

By MORETON RICHES.

Wandsworth.—34 to 48 (even), Burtop-rd., f., w.r. 176*l.* 16s.	2,050
17 and 19, Harbut-rd., u.t. 74 yrs., g.r. 13*l.* 10s., w.r. 62*l.*	555
Norwood.—105 to 111 (odd), Queen's-rd., u.t. 72½ yrs., g.r. 16*l.*, w.r. 109*l.* 4s.	700

By THOLE & NEWMAN.

South Kensington.—12, Priory-gr., u.t. 26½ yrs., g.r. 5*l.* 10s., p.	600

February 17.—By DUNN, SOMAN, & COVERDALE.

Dalston.—38 to 48 (even) and 48A, Holly-st., u.t. 12½ yrs., g.r. 25*l.* 12s., w.r. 241*l.* 6s.	640

By FISHER, STANHOPE, & DRAKE.

Stamford-hill.—124, Bethune-rd., u.t. 75 yrs., g.r. 12*l.*, e.r. 80*l.*	800

By WALTER HALL.

Hampstead.—92, Priory-rd., f., p.	1,725
Willesden Green.—14, 16, 18, and 20, Litchfield-gdns., u.t. 96 yrs., g.r. 22*l.*, e.r. 136*l.*	950

By MULLETT, BOOKER, & CO.

Hyde Park.—6, Hyde Park-sq., u.t. 30 yrs., g.r. 30*l.*, y.r. 275*l.*	2,800
28, Hyde Park-st., and 5, Southwick-yd., u.t. 30 yrs., g.r. nil, y.r. 240*l.*	2,900
10, Polygon-mews South, u.t. 18 yrs., g.r. 15*l.*, y.r. 25*l.*	105
Hyde Park-st., 1 g.r. 80*l.*, u.t. 30 yrs., g.r. 4*l.*	1,150
Gloucester-sq., 1 g.r. 50*l.*, u.t. 31 yrs., g.r. 16*l.*	560
Gloucester-sq., 1 g.r. 210*l.*, u.t. 31 yrs., g.r. 2*l.*	3,025
Gloucester-ter., etc. 1 g.r., 116*l.*, u.t. 33 yrs., g.r. nil	1,810

By TYSER, GREENWOOD, & CRIER.

Chiswick.—581, High-rd., u.t. 64 yrs., g.r. 8*l.*, p.	460

February 16.—By SIMMONS & SONS (at Banbury).

Greatworth, Northants.—"Floyd's" and "Whitman's" Farms, 160 a. 1 r. 27 p., f., e.r. 285*l.*	4,225
Brackley, Northants.—High-st., freehold house and gdn., y.r. 14*l.*	310

February 18.—By TUCKETT & SON (at South-end-on-Sea).

Leigh-on-Sea, Essex.—1 to 6, Hill-villas, f., y.r. 98*l.*	2,010
1, 2, and 3, Ivy-cottages, f., y.r. 19*l.* 10s.	400
28, High-st. (s.), f., y.r. 18*l.*	320
Great Wakering, Essex.—Freehold shop, house and premises, y.r. 30*l.*	510
Freehold shop and two cottages, e.r. 25*l.*	120
Two freehold shops and houses, y.r. 26*l.*	270
Two freehold cottages, e.r. 8*l.*	110

February 20.—By BROWETT & TAYLOR.

Highbury.—15, Highbury-pl. (s.), f., y.r. 125*l.*	2,180
Croydon.—St. James' Pk., "Rosslyn Villa," f., e.r. 38*l.*	400
Wandsworth.—326, Merton-rd., f., e.r. 34*l.*	400
St. George's East.—109, St. George's-st. (s), f., y.r. 45*l.*	620
Whitechapel.—16, Fieldgate-st. (s.), f., y.r. 60*l.*	735
Mile End.—48, Lincoln-st., f., w.r. 36*l.* 8s.	355

By HY. HOLMES & CO.

Pimlico.—4, Gloucester-st., u.t. 26½ yrs., g.r. 10*l.*, e.r. 90*l.*	545

By S. WALKER & SON.

Balham.—Balham High-rd., l.g. rents 24*l.*, u.t. 30½ yrs., g.r. nil	285

By T. WOODS.

Sutton, Middlesex.—Main-rd., "Harts," otherwise "Sutton Farm," also "Springwell" Fruit Plantation, area 46 a. 2 r. 20 p., f., e.r. 275*l.*	6,250

By WILKINSON, SON, & WELCH (at Brighton).

Hove, Sussex.—1, Medina-ter., and 1A, Victoria-ter. (flats and shop), f., y.r. 30 5*l.*	3,275

February 21.—By C. H. BROWN.

Pimlico.—62 and 64, Bessborough-st., u.t. 27 yrs., g.r. 10*l.*, w.r. 78*l.*	500
Westminster.—61 and 63, Vincent-st., u.t. 4½ yrs., g.r. 14*l.*, w.r. 59*l.* 16s.	260

By PERKINS & SONS.

Southampton.—The Polygon, "The Elms Estate," 6 a. 2 r. 34 p., f.	7,550

By REYNOLDS & EASON.

St. George's East.—51, 53, 55, and 59, Cable-st. (s), c., y.r. 100*l.*	1,605

By INMAN SHARP, HARRINGTON, & CO.

Regent-street.—17, Brewer-st. (s.), f., y.r. 80*l.*	2,500
Finsbury.—78 to 84 (even), Clifton-st., f., y.r. 100*l.*	2,110

By HOBSON, RICHARDS, & CO. (at Cricklade).

Cricklade, Wilts.—"Plants Farm," 41 a. 2 r. 9 p., f., y.r. 50*l.*	1,270
Ham and Leys enclosures, 7 a. 0 r. 25 p., f., y.r. 14*l.*	265

By H. & R. L. COBB (at Rochester).

New Brompton, Kent.—Jeffrey-st., "The Flower of Kent" b.h., with house and land adjoining, f., y.r. 120*l.*	3,000

By G. LOVEITT & SONS (at Coventry).
Coventry, Warwick.—7 and 8, Cheylesmore, f., y r. 28*l.* £410
59 and 60, New-buildings, f., w.r. 2*4l.* 8s... 385
10 and 12, Swanswell-st., with slaughter house, f., y.r. 40*l.* 2s. 590
50, Stoney Stanton-rd., f., y.r. 18*l.*..... 260
15, Ford-st., f., y.r. 25*l.*..... 540
26, Little Park-st. (s.), f., y.r. 19*l.* 300
Moor-st., a plot of building land, f..... 104
47 and 49, Arden-st., f..... 280
12, 13, 40, and 41, Mount-st., f. 775

February 22.—By S. B. CLARK & SON.
Cavendish-square.—13A, Upper Wimpole-st., u.t. 73 yrs., g.r. 25*l.*, p..... 5,750
Marylebone.—48, Portland-pl., and 8, Charlotte-mews, u t. 25 yrs., g.r. 150*l.*, p..... 5,650
10, Duke-st., u.t. 4¼ yrs., g.r. 30*l.*, e.r. 235*l.* 315

By EDWARD & CO.
Whitechapel.—33, Church-la. (s.), f., with fixtures and fittings 860
Mile End.—62 to 70 (even), Ernest-st., f., w.r. 122*l.* 4s..... 1,080

By WM. HOLLIS.
Hendon.—18 and 18A, Ravenhurst-av., u.t. 96½ yrs., g.r. 6*l.* 6s., w.r. 45*l.* 10s. 280
Sunny-gdns., a freehold building site 400

By MAY & PHILPOT.
Brixton.—39, Arodene-rd., u.t. 85 yrs., g.r. 7*l.*, p..... 550
102, Arodene-rd., u.t. 85 yrs., g.r. 8*l.*, p. .. 600
14, Arthu -rd., u.t. 58½ yrs., g.r. 5*l.* 5s. p... 285
Streatham.—4, Tenham-av., f., y.r. 72*l.* 8s. .. 690

By ROGERS, CHAPMAN, & THOMAS.
Pimlico.—79, Claverton-st., u.t. 28½ yrs., g.r. 10*l.*, p. 490

By R. TIDEY & SON.
Walthamstow.—286, Hoe-st. (s.), f., y.r. 90*l.*.. 1,870

February 23.—By WORSFOLD & HAYWARD.
Tunbridge Wells, Kent.—Warwick Pk., "Cliff House" and 1 acre, u.t. 93½ yrs., g.r. 36*l.*, p. 2,800
Harlesden.—22, Tunley-rd., u.t. 87 yrs., g.r. 6*l.*, e.r. 32*l.* 280

By HUMPHREYS, SKITT, & HUMPHREYS.
Greenwich.—Croom's-hill, f.g. rents 43*l.*, reversion in 30 yrs. 1,075
Croom's-hill-gr., f.g. rents 63*l.*, reversion in 30 yrs..... 1,890

By C. C. & T. MOORE.
Hoxton.—26, Buckland-st., u.t. 29½ yrs., g.r. 5*l.*, q.r. 36*l.*..... 330
Mile End.—72 and 74, Dempsey-st., u.t. 8½ yrs., g.r. 6*l.*, y.r. 90*l* 140
Bow.—22, Vernon-rd., f., w.r. 44*l.* 4s..... 515

By RUTTERS'.
Tooting.—38, 40, and 42, Pevensey-rd., u.t. 99 yrs., g.r. 9*l.* 15s., w.r. 49*l.* 8s. 520

By NEWBON, EDWARDS, & SHEPHARD.
Kentish Town —40 and 48, Dale-rd , u t. 59½ yrs., g.r. 12*l.* 6s., y.r. 76*l.*..... 875
11, Vicars-rd., u.t. 60 yrs., g.r. 6*l.*, y.r. 38*l.* 365
Hampstead-road.—122, Stanhope-st., u.t. 16½ yrs., g r. 6*l.*, y.r 52*l.* 350
Wood Green.—15, Eastern-rd., f., y.r. 32*l.* .. 470
Islington.—246 and 248, Essex-rd., u.t. 13 yrs., g.r. 6*l.* 13s. 4d., y.r. 85*l.* 340
Holloway.—2, Witley-rd., u.t. 58½ yrs., g.r. 5*l.* 5s., y.r. 34*l.* 295

By STIMSON & SONS.
Kentish Town.—16, Wellesley-rd., u.t. 41 yrs., g r. 6*l.*, y.r. 36*l.* 300
Tottenham.—9, Pembury-rd., u.t. 73 yrs., g.r. 4*l.* 10s., e.r. 28*l.* 275
Battersea.—18 to 30 (even). John-st., u.t. 56 yrs., g.r. 24*l.* 10s., w.r. 226*l.* 4s. 1,125
Greenwich.—9, Frobisher-st., u.t. 51 yrs., g.r. 3*l.* 4s., w.r. 28*l.* 12s. 205
Dulwich.—447, Lordship-la., f., e.r 75*l.*..... 1,000
Wandsworth.—84, High-st. (s.), f., e.r. 80*l.* .. 950
Hackney.—2, Casterton-st., u.t. 73½ yrs., g.r. 5*l.* 8s..... 225

February 24.—By LEOPOLD FARMER & SONS.
Camden Town.—104, Camden-st., u.t. 34½ yrs., g r. 6*l.*, y.r. 50*l.* 530
Hampstead-road —31 and 32, Edward-st., u.t. 16½ and 19½ yrs , g.r. 16*l.*, y.r. 101*l.* 740
55, William-st., u.t. 19½ yrs., g.r. 3*l.*, y.r. 40*l.* 325
82 and 84, Robert-st., u.t. 18½ yrs., g.r. 14*l.*, y.r. 80*l* 430
Regent's Park. — Cumberland-market, etc., l.g.r. 27*l.* 10s., u.t. 20 yrs., g.r. 7*l.* 10s. .. 165

By MAPLE & CO.
Hampstead.—38, Belsize-gr., u.t. 19 yrs., g.r. 7*l.* 3s., subject to two Royal lives, p..... 230

By WRIFORD, DIXON, & WINDER.
Fulham.—66 to 74, Star-rd., with builder's yard adjoining, u.t. 91 yrs., g.r. 36*l.*, w.r. 384*l.* 4s. 2,990

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

FRIDAY, MARCH 3.

Royal Institution.—Chevalier G. Marconi, LL.D., on "Recent Advances in Wireless Telegraphy." 9 p.m.

Junior Institution of Engineers (Westminster Palace Hotel).—A Paper will be read on "Possible Improvements in Locomotive Practice," by Mr. Walter Longland. 8 p.m.

SATURDAY, MARCH 4.

Royal Institution.—Mr. D. G. Hogarth, M.A., on "Archæology." II. 3 p.m.

Incorporated British Institute of Certified Carpenters.—Mr. H. P. Fletcher on "The St. Louis Exhibition," illustrated by limelight views. 6.15 p.m.

MONDAY, MARCH 6.

Royal Institute of British Architects.—(1) Special General Meeting, to elect the Royal Gold Medallist for the current year; (2) Ninth General (Business) Meeting, to elect candidates for membership; (3) Mr. H. Phillips Fletcher on "The St. Louis Exhibition, 1904," with lantern slides. 8 p.m.

Liverpool Architectural Society.—Mr. G. P. Bankhart on "Lead Work," illustrated by limelight views. 6 p.m.

Glasgow Philosophical Society (Architectural Section).—Annual Business Meeting. 8 p.m.

Society of Engineers.—Mr. B. H. Thwaite on "The Transport Possibilities of our Inland Navigable Waterways." 7.30 p.m.

TUESDAY, MARCH 7.

Society of Designers.—Mr. E. F. Strange on "Ornament from Old English Rood-Screens," illustrated by drawings and lantern slides. 8 p.m.

Northern Architectural Association.—Annual Meeting. 7.30 p.m. Discussion, to be opened by Mr. A. W. S. Cross, M.A., and Mr. G. Hubbard, F.S.A., on "The Statutory Qualification of Architects." 8 p.m.

Institution of Civil Engineers.—Paper to be discussed: "Surface-Condensing Plants, and the Value of the Vacuum Produced," by Mr. R. W. Allen. 8 p.m.

WEDNESDAY, MARCH 8.

Edinburgh Architectural Association.—Mr. Hippolyte J. Blanc, R.S.A., on "The Arts of the Monastery," illustrated by lantern slides. 8 p.m.

THURSDAY, MARCH 9.

Architects' Benevolent Society.—Annual General Meeting of the Subscribers and Donors in the rooms of the Royal Institute of British Architects. The President, Mr. John Belcher, A.R.A., will take the chair at 5 o'clock.

Royal Institution.—Professor H. H. Turner, D.Sc., on "Recent Astronomical Progress," II. 5 p.m.

Carpenters' Hall (London Wall).—Mr. J. Willis Clark, M.A., F.S.A., on "The Origin and Development of the Collegiate Plan at Oxford and Cambridge." 8 p.m.

Society of Antiquaries.—8.30 p m.

Leeds and Yorkshire Architectural Society.—Mr. E. C. Skill on "Architectural Photography." 6.30 p.m.

Institution of Electrical Engineers.—Report on Experiments carried out at the National Physical Laboratory: "On the Effect of Heat on the Electrical and Mechanical Properties of Dielectrics," and "On the Temperature Distribution in the Interior of Field Coils," presented by Dr. R. T. Glazebrook, F.R.S., and "On Temperature Curves and the Rating of Electrical Machinery," by Mr. R. Goldschmidt. 8 p.m.

FRIDAY, MARCH 10.

Royal Institution.—Professor J. J. Thomson, LL.D., D.Sc., on "The Structure of the Atom." 9 p.m.

Architectural Association.—Mr. H. V. Lanchester on "Law Courts." 7.30 p.m.

Institution of Civil Engineers (Students' Meeting).—(1) "The Purification of Sewage," by Mr. F. G Helsby; (2) "The Purification of Sewage by Hydrolysis and Oxidation," by Mr. F. O. Kirby. 8 p.m.

SATURDAY, MARCH 11.

Royal Institution.—Professor J. J. Thomson, LL.D., D.Sc., on "Electrical Properties of Radioactive Substances," I. 3 p.m.

Junior Institution of Engineers.—Visit to the New Ritz Hotel, Piccadilly, to inspect the "Cage Skeleton" System of Constructional Engineering. 3 p.m.

Edinburgh Architectural Association.—Visits (1) to Midlothian County Court Buildings; (2) The new *Scotsman* Office Buildings.

PUBLISHER'S NOTICES.

Nat. Tel., 6112, Gerrard. Telegrams, "The Builder, London."

THE INDEX (with TITLE-PAGE) for VOLUME LXXXVII. (July to December, 1904) was given as a supplement with the issue for January 14 last.

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BRICKS, &c.

	£	s.	d.			
Hard Stocks.	1	12	0	per 1000	alongside, in river.	
Rough Stocks and Grizzles	1	8	0	,,	,,	,,
Facing Stocks ...	2	5	0	,,	,,	,,
Shippers	2	5	0	,,	,,	,,
Flettons	1	8	0	,,	at railway depôt.	
Red Wire Cuts ...	1	14	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire ...	4	4	0	,,	,,	,,
Do. Bullnose	4	10	0	,,	,,	,,
Best Stourbridge Fire Bricks.....	4	8	0	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	12	0	0	,,	,,	,,
Headers	11	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	16	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers...	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats.....	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers...	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays, Chamferred, Squints	14	0	0	,,	,,	,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.	

	s.	d.		
Thames and Pit Sand.....	7	0	per yard,	delivered.
Thames Ballast.....	5	9	,,	,,
Best Portland Cement	27	0	per ton,	,,
Best Ground Blue Lias Lime	20	0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime.....12s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s.	d.		
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	,,	,,
PORTLAND STONE (20 ft. average)— Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2	1	,,	,,
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf...	2	2½	,,	,,

	s.	d.		
Ancaster in blocks	1	11	per ft. cube,	deld. rly. depôt.
Beer ,, ...	1	6	,,	,,
Greenshill ,, ...	1	10	,,	,,
Darley Dale in blocks...	2	4	,,	,,
Red Corsehill ,,	2	5	,,	,,
CloseburnRedFreestone	2	0	,,	,,
Red Mansfield ,,	2	4	,,	,,
YORK STONE—*Robin Hood Quality.*				
Scappled random blocks	2	10	,,	,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super.	,,
6 in. rubbed two sides ditto, ditto	2	6		,,

STONE (*continued*).

YORK STONE—*Robin Hood Quality* (*continued*).

	s.	d.	
3 in. sawn two sides slabs (random sizes)	0	11½	per ft. super. deld. rly. depôt
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	„ „
1½ in. to 2 in. ditto, ditto	0	6	„ „
HARD YORK—			
Scappled random blocks	3	0	per ft. cube. „
6 in. sawn two sides, landings to sizes (under 40 ft. super.)	2	8	per ft. super. „
6 in. rubbed two sides ditto	3	0	„ „
3 in. sawn two sides (slabs random sizes)	1	2	„ „
2 in. self-faced random flags	0	5	„ „

	s.	d.	
Hopton Wood (Hard Bed) in blocks	2	3	per ft. cube. deld. rly. depôt.
„ „ „ 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
„ „ „ 3 in. do.	1	2½	„ „

SLATES.

in.	in.	£	s.	d.	
20	× 10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20	× 12 „ „	13	17	6	„ „
20	× 10 first quality „	13	0	0	„ „
20	× 12 „ „ „	13	15	0	„ „
16	× 8 „ „ „	7	5	0	„ „
20	× 10 best blue Portmadoc	12	12	6	„ „
16	× 8 „ „	6	12	6	„ „
20	× 10 best Eureka unfading green	15	17	6	„ „
20	× 12 „ „	18	7	6	„ „
18	× 10 „ „	13	5	0	„ „
16	× 8 „ „	10	5	0	„ „
20	× 10 permanent green	11	12	6	„ „
18	× 10 „ „	9	12	6	„ „
16	× 8 „ „	6	12	6	„ „

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. „ „
Best Brosely tiles	50	0	per 1000 „ „
Do. Ornamental tiles	52	6	„ „ „
Hip and Valley tiles	4	0	per doz. „ „
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 „ „
Do. Ornamental do	60	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	0	„ „ „
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 „ „
Do. Ornamental do	54	6	„ „ „
Hip tiles	4	1	per doz. „ „
Valley tiles	3	8	„ „ „
Best "Rosemary" brand plain tiles	48	0	per 1000 „ „
Best Ornamental tiles	50	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	8	„ „ „
Best "Hartshill" brand plain tiles, sand faced.	50	0	per 1000 „ „
Do. pressed	47	6	„ „ „
Do. Ornamental do	50	0	„ „ „
Hip tiles	4	0	per doz. „ „
Valley tiles	3	6	„ „ „

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	13	10	0	15	0	0
Deals: best 3 by 9	13	0	0	14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	„ „ „		
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	„		
	At per load of 50 ft.					
Fir timber: best middling Danzig or Memel (average specification)	4	10	0	5	0	0
Seconds	4	0	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	10	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	0

JOINERS' WOOD.	At per standard. £	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in	24	0	0	25	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals, 3 in by 11 in.	18	10	0	20	0	0
„ „ 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	12	0	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	14	0	0
Do. 3 in. by 9 in.	12	10	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg :—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
„ „ 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
„ „ 3 in. by 9 in.	12	10	0	13	10	0
„ „ battens	10	0	0	11	0	0

WOOD (*continued*).

JOINERS' WOOD (*continued*).	At per standard. £	s.	d.	£	s.	d.
Pitch-pine: deals	16	10	0	20	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	40	0	0	upwards.		
Oddments	28	0	0	„		
Seconds, regular sizes	30	0	0	„		
Yellow Pine oddments	25	0	0	„		
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	3	0	0	3	6
Small „ „	0	2	6	0	2	9
Wainscot Oak Logs, per ft. cube.	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	9
¾ in. do. do.	0	0	7		—	
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	1	0
Selected, Figury, per ft. sup. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. sup. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	21	0	0
American Whitewood Planks, per ft. cube	0	4	0	0	5	0
Prepared Flooring, etc.—		Per		square.		
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. do. do.	0	14	0	0	18	0
¾ in. by 7 in. white do. do.	0	10	0	0	11	6
1 in. by 7 in. do. do.	0	12	9	0	15	0
6 in. at 6d. to 9d. per square less than 7 in.						

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.		£	s.	d.
Rolled Steel Joists, ordinary sections	5	15	0	...	6	15	0
Compound Girders, ordinary sections	7	5	0	...	8	7	6
Steel Compound Stancheons	9	2	6	...	10	12	6
Angles, Tees and Channels, ordinary sections	7	7	6	...	8	7	6
Flitch Plates	7	15	0	...	8	5	0
Cast Iron Columns and Stanchions including ordinary patterns	6	12	6	...	7	15	0

METALS.

	Per ton, in London. £	s.	d.		£	s.	d.
IRON—							
Common Bars	7	0	0	...	7	10	0
Staffordshire Crown Bars, good merchant quality	7	10	0	...	8	0	0
Staffordshire "Marked Bars"	9	10	0	...		—	
Mild Steel Bars	8	5	0	...	8	15	0
Hoop Iron, basis price	8	15	0	...	9	0	0
„ „ Galvanized	16	10	0	...		—	
(*And upwards, according to size and gauge.)							
Sheet Iron, Black—							
Ordinary sizes to 20 g.	9	0	0	...		—	
„ „ 24 g.	10	0	0	...		—	
„ „ 26 g.	11	15	0	...		—	
Sheet Iron, Galvanised, flat, ordinary quality—							
Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g.	12	10	0	...		—	
Ordinary sizes to 22 g. and 24 g.	13	0	0	...		—	
„ „ 26 g.	14	0	0	...		—	
Sheet Iron, Galvanised, flat, best quality—							
Ordinary sizes to 20 g.	15	10	0	...		—	
„ „ 22 g. and 24 g.	16	0	0	...		—	
„ „ 26 g.	17	10	0	...		—	
Galvanised Corrugated Sheets—							
Ordinary sizes 6 ft. to 8 ft. 20 g.	12	10	0	...		—	
„ „ 22 g. and 24 g.	13	0	0	...		—	
„ „ 26 g.	13	15	0	...		—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	0	0	...		—	
Best Soft Steel Sheets, 22 g. & 24 g.	12	0	0	...		—	
„ „ „ 26 g.	13	10	0	...		—	
Cut nails, 3 in. to 6 in.	9	0	0	...	9	10	0
(Under 3 in., usual trade extras.)							

LEAD, &c.

	Per ton, in London. £	s.	d.		£	s.	d.
LEAD—Sheet, English, 3lb. and up	15	0	0	...		—	
Pipe in coils	15	10	0	...		—	
Soil pipe	18	0	0	...		—	
Compo pipe	18	0	0	...		—	
ZINC—Sheet—							
Vieille Montagne ...ton	30	15	0	...		—	
Silesian	30	10	0	...		—	
COPPER—							
Strong Sheet...per lb.	0	0	10	...		—	
Thin „ „	0	0	11	...		—	
Copper nails „	0	0	10	...		—	
BRASS—							
Strong Sheet „	0	0	9½	...		—	
Thin „ „	0	0	10	...		—	
TIN—English Ingots „	0	1	4½	...		—	
SOLDER—Plumbers' „	0	0	6½	...		—	
Tinmen's „	0	0	8	...		—	
Blowpipe „	0	0	9	...		—	

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
„ fourths	2d. „ „
21 oz. thirds	3¾d. „ „
„ fourths	3d. „ „
26 oz. thirds	4¾d. „ „
„ fourths	3¾d. „ „
32 oz. thirds	5¾d. „ „
„ fourths	5d. „ „
Fluted Sheet, 15 oz.	3¾d. „ „
„ 21 oz.	4¼d. „ „
⅛ Hartley's Rolled Plate	2d. „ „
⅜ „ „ „ „	2¼d. „ „
¼ „ „ „ „	2½d. „ „

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	6
„ „ „ in barrels	„	0	1	7
„ „ „ in drums	„	0	1	9
Boiled „ „ in pipes	„	0	1	8
„ „ „ in barrels	„	0	1	9
„ „ „ in drums	„	0	1	11
Turpentine, in barrels	„	0	3	4
„ in drums	„	0	3	6
Genuine Ground English White Lead	per ton	19	15	0
Red Lead, Dry	„	19	5	0
Best Linseed Oil Putty	per cwt.	0	6	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, &c., 26s. per annum. Remittances (payable to J. MORGAN) should be addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post*.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BURNLEY.—For making-up, etc., about thirty-seven streets, Briercliffe, for the Rural District Council. Mr. S. Edmondson, surveyor, 18, Nicholas-street, Burnley:—

		Exors. A.	
T. E. Sugden	£4,945 4 10	Broadley	£4,191 8 1
R. Wadge	4,874 1 4	G. A. Watson & Co.	4,180 14 6
J. R. Atkinson	4,542 16 3	J. Miles	4,077 12 11
W. Shepherd	4,465 6 3	J. Green, Burnley*	4,077 1 4
G. Read & Sons	4,408 16 4	S. Burgess	4,012 0 7

CHADWELL ST. MARY (Essex). — For surface drainage and making-up of Ottawa-road, Bermuda-road, and Malton-road, for Orsett Rural District Council. Mr. F. Lowry, engineer, Hornchurch:—

Road Maintenance & Stone Supply Co., Ltd.	£2,704 10 4	W. White	£1,928 6 0
Smith & Co.	2,264 0 0	H. Butcher	1,885 11 1
C. B. Rons	2,054 8 9	Wilson, Border, & Co.	1,870 9 7
Porter & Co.	2,038 0 0	H. A. Gower	1,804 4 6
H. Philbey	2,022 7 2	J. Jackson	1,779 8 0
W. Manders	1,956 6 9	T. W. Marsh	1,659 6 1
		A. Wisby & Co., Grays*	1,506 4 1

CONISBORO'.—For erecting a residence. Mr. H. L. Smethurst, architect, Conisboro':—

S. Lamb	£1,635 0 0	D. Gill & Son	£947 0 0
Carpenter & Co.	1,400 0 0	B. Wartley & Son, Doncaster*	794 0 0
W. Baines	1,069 10 1½	C. Lazenby	780 0 0
T. Gray & Sons	1,056 0 0		
Johnson & Moore	957 0 0		

ERITH.—For the erection of mechanically operated gates at the level crossing of the ballast wharf sidings, West-street, for the Urban District Council. Messrs. Hawtayne & Zeden, engineers, 9, Queen-street Place, London, E.C.:—

Contract No. 5, *Overhead Equipment, etc.*

Brush Electrical Engineering Co., Ltd., Loughborough £4,217 0

Contract No. 6, *Cables, etc.*

Callenders' Cable, etc., Co., Ltd., Belvedere .. £2,590 4

Contract No. 7, *Rotary Converters, etc.*

British Westinghouse Electrical, etc., Co., Ltd., Strand, W.C. £1,545 5

Contract No. 8, *Switchboards, etc.*

Kelvin & J. White, Ltd., Glasgow £1,047 10

LONDON.—For the erection of a new generating station, Manor-street, Chelsea, for the Chelsea Electricity Supply Co., Ltd. Mr. Alfred Roberts, architect, 92, London-street, Greenwich:—

H. & F. H. Higgs	£14,313	Patman & Fotheringham	£12,923
B. E. Nightingale	13,498	Holliday & Greenwood, Ltd.	12,666
Lole & Co.	13,342	J. Greenwood, Ltd.*	11,865
F. & T. Thorne	13,200		

TENDERS.—*Continued on page* 253.

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, etc., still open, but not included in this List, see previous issues.

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tenders, etc., supplied by	Tenders to be Delivered
Filters and Tank, Paisley Waterworks	Paisley Water Commissioners	J. Lee, Engineer, 13, Gilmour-street, Paisley	Mar. 3
Repair of Portable Steam Engine at Sewage Farm	Romford U.D.C.	C. T. King, Clerk, Council Offices, Romford	Mar. 4
Paving and Flagging Streets	Leeds Corporation	City Engineer's Office, Municipal-buildings, Leeds	do.
Materials, Labour, etc.	do.	G. Darley, Dock-street Depot, Leeds	do.
Paving, Sewering, etc. (several districts)	Manchester Corporation	Paving, etc., Dept. (Surveyor's Office), Town Hall, Manchester	do.
A 14-n.h.p. Horizontal Non-condensing Steam Engine	Birmingham Baths Committee	J. Cox, Superintendent Engr. & Sec., Kent-street, Birmingham	do.
A Set of Treble Deepwell Lifting Pumps	do.	do.	do.
Two Steel Steam Boilers	do.	do.	do.
Cast-Iron Cold Water Storage Tank	do.	do.	do.
Two Wrought-Iron Galvanized Tanks, etc.	do.	do.	do.
Two Special Steam Heaters	do.	do.	do.
400 tons of Quenast or Guernsey Granite	Chingford U.D.C.	H. Bird, Clerk, 34, Station-road, Chingford, Essex	do.
1,000 yds. of Stone Ballast	do.	do.	do.
Tramp Cells at Workhouse	Swansea Guardians	L. Jenkins, Clerk, Union Offices, Alexandra-road, Swansea	do.
Road Materials	Wangford R.D.C.	F. S. Rix, Clerk, Beccles	Mar. 6
Railway Sleeper-blocks and Crossing-sleepers	North Eastern Railway Co.	E. H. Clark, Stores Superintendent, Gateshead	do.
Fence Posts and Rails	do.	do.	do.
Road Material	Wath-upon-Dearne U.D.C.	H. C. Poole, Surveyor, Town Hall, Wath-upon-Dearne	do.
Underground Telephone Pipes	Manchester Paving, etc., Committee	City Surveyor's Office, Town Hall, Manchester	do.
Granite	Oxendon R.D.C.	C. Burgoine, Clerk, Market Harborough	do.
Blacksmith's Shop, Mendlesham	Trustees, Mendlesham Charities	H. G. Bishop, Architect, Market-place, Stowmarket	do.
Main Road Material	Hunts C.C.	H. Leete, County Surveyor, County Council Offices, Huntingdon	do.
Painting and Repairs of Technical School, etc.	Macclesfield Education Authority	Secretary of Education Committee, Town Hall, Macclesfield	Mar. 7
Making Finchley-road, Altrincham	Altrincham U.D.C.	J. Stokoe, Clerk, Altrincham	do.
Rails and Fish-plates	Secretary of State for India	Director-General of Stores, India Office, Whitehall	do.
Wheels and Axles for Carriages	do.	do.	do.
Detached Residence at Settle	.....	J. Hartley, Architect, Skipton	do.
Stores and Materials	Great Central Railway Co.	O. S. Holt, Secretary, London-road Station, Manchester	do.
Tram Rails	B'ham. Public Works Committee	J. Price, City Surveyor, Council House, Birmingham	do.
Extension of Drummond-road and New Road	Birmingham Corporation	do.	do.
Making-up Roads, Tar-paving Footways	East Barnet Valley U.D.C.	H. York, Surveyor, Council Offices, Station-road, New Barnet	do.
Painting Regent-road and Broughton Baths	Salford Baths Committee	General Superintendent, Blackfriars-road Baths, Salford	do.
Broken Granite	Market Bosworth R.D.C.	W. Thorpe, Highway Surveyor, Nailstone, Nuneaton	do.
Materials (Withington Committee)	Manchester Corporation	Surveyor to the Committee, Town Hall, W. Didsbury, Manchester	do.
37 tons Paints, 33 tons Red and White Lead, etc.	Southern Mahratta Railway Co.	E. Z. Thornton, Secretary, 46, Queen Anne's-gate, S.W.	do.
Laundry Equipment	Lisburn Guardians	W. Sinclair, Clerk, Poor Law Offices, Lisburn	do.
Making up Argyle-road, Hounslow	Heston and Isleworth U.D.C.	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	do.
1,180 yds. of Stormwater Sewer, Staines-rd., Hounslow	do.	do.	do.
Wood and Iron School Building	Bradford Education Committee	Education Office (Architects' Department), Manor-row, Bradford	do.
Plant House at Cemetery, Stafford	Burial Board Committee	W. Blackshaw, Borough Hall, Stafford	do.
Twenty-five Houses at Abertysswg	Abertysswg Building Society	J. M. Davies, 11, The Green, Abertysswg	Mar. 8
Annual Contracts	Twickenham U.D.C.	F. W. Pearce, Surveyor, Town Hall, Twickenham	do.
45 tons of Steel Girder Rails	Altrincham Gas Co.	J. Newton, Son, & Bayley, Engineers, 17, Cooper-st., Manchester	do.
Laying 500 yds. of Railway along Moss-lane	do.	do.	do.
300,000 Dog Spikes	East India Railway Co.	C. W. Young, Secretary, Nicholas-lane, London, E.C.	do.
Team Labour	Market Bosworth R.D.C.	W. Thorpe, Highway Surveyor, Nailstone, Nuneaton	do.
Road Metal, Cartage, Haulage, etc.	Durham C.C.	County Surveyor's Office, Shire Hall, Durham	do.
Baptist Sunday Schools at Farsley	.....	Wilson Bailey, Architect, Bradford and Keighley	do.
Milk Depot at Northallerton	North Eastern Railway Co.	W. Bell, Architect to the Company, York	do.
Painting Station Buildings	do.	C. A. Harrison, Engineer, Central Station, Newcastle-on-Tyne	do.
Elec. Bells, Telephone, and Fire Alarms, Whips Cross	West Ham Guardians	Clerk's Office at Infirmary, Whips Cross-road, Leytonstone, N.E.	do.
Auxiliary Fire Hydrants, Infirm., Whips Cross, N.E.	do.	do.	do.
Ferro-Concrete Foundations for Crane, Town Quay	Southampton Harbour Board	E. Cooper Poole, Engr., Harbour Office, Town Quay, Southampton	do.
Tar-paving at Coedfrane School, Skewen	Glamorgan C.C.	T. M. Franklin, County Council Offices, Westgate-street, Cardiff	do.
Folding Partition & Lavatory at Peniel-green School	do.	do.	do.
Materials	Heston and Isleworth U.D.C.	P. G. Parkman, Engineer, Town Hall, Hounslow, W.	do.
32 Concrete Block Houses, Aignish Farm, Stornoway	.....	E. K. Carmichael, C.E., 14, Queen-street, Edinburgh	do.
Road Material and Works	Hendon R.D.C.	J. A. Webb, Surveyor, Great Stanmore	do.
Alterations, etc., Norwich Free Library	Free Library Committee	A. E. Collins, City Engineer, Guildhall, Norwich	do.
Barging Rubbish, etc., and Hauling, etc.	East Stonehouse U.D.C.	F. A. Wiblin, Surveyor, Town Hall, East Stonehouse, Devon	Mar. 9
Stores and Materials	Carlisle Corporation	H. C. Marks, City Engineer, 36, Fisher-street, Carlisle	do.
Stores, Gas Department	Birmingham Corporation	G. H. Barber, Sec., City Gas Offices, Council House, Birmingham	do.
Macadam	Fenton U.D.C.	S. A. Goodall, Surveyor, Town Hall, Fenton	do.
Granite, etc.	Tamworth Town Council	F. E. G. Bradshaw, Borough Surveyor, 36, Aldersgate, Tamworth	do.
Block of Workmen's Houses, Elgin	.....	J. Wittet, Architect, Elgin	do.
Additions, Roath Steam Laundry, Cardiff	.....	Bruce Vaughan, Architect, Cardiff	do.
*Cast-Iron Fire Alarms, etc.	London C.C.	Clerk to the Council, County Hall, Spring-gardens, S.W.	do.
Granite	Market Harborough R.D.C.	C. Burgoine, Clerk, Market Harborough	Mar. 10
Alterations, etc., to Council Schools, Etwall	The Managers	A. Eaton, Architect, 6, St. James'-street, Derby	do.
Boring, 400 ft. deep	Selby U.D.C.	P. Griffith, Engineer, 54, Parliament-street, Westminster, S.W.	do.
Repair of Roads	Dorchester R.D.C.	F. H. Polkinghorne, Surveyor, 2, Dagmar-road, Dorchester	do.
Whitewashing, Union Infirmary, Hope, near Eccles	Salford Guardians	Steward of the Infirmary	do.
Building Materials, etc., for Cardiff Workhouse	The Guardians	A. J. Harris, Clerk, Queen's-chambers, Cardiff	do.
A Fan and Engine House, Aberpergwm Collieries	.....	J. Roberts, M.E., Fisher-street, Swansea	do.
*Royal Naval Reserve Buildings at Ullapool	Admiralty	Superintending Engr., H.M. Naval Estab., Rosyth, Inverkeithing	do.
*Royal Naval Reserve Buildings at Banff	do.	do.	do.
Drummond-street School	Edinburgh School Board	Mr. Carfrae, Architect, 3, Queen-street, Edinburgh	Mar. 11
Isolation Hospital at Friarton, Perth	Perth Town Council	G. P. K. Young, A.R.I.B.A., 42, Tay-street, Perth	do.
Masonry and Street Work, Calder Bridge Widening	Brighouse Corporation	S. S. Haywood, Borough Engineer, Municipal Offices, Brighouse	do.
Laboratory at Withington Sewage Works, Chorlton	Manchester Rivers Committee	Rivers Department, Town Hall, Manchester	do.
Team Labour	Stafford R.D.C.	F. G. Herbert, Surveyor, 37, Alexandra-road, Stafford	do.
Painting Works at Ham Green Hospital	Bristol Health Committee	T. H. Yabbicom, City Engineer, 63, Queen-square, Bristol	do.
Materials	Coventry Corporation	J. E. Swindlehurst, City Engineer, St. Mary's Hall, Coventry	do.
Pumps, Engine, and Boilers	Uxbridge U.D.C.	F. S. Courtney, Engineer, 25, Victoria-street, Westminster	do.
Twenty-eight Houses, Park Hill, Tredegar	Chamber of Trade Building Club	W. Beddoe Rees, Architect, 3, Dumfries-place, Cardiff	do.
Sand Filter, etc., at Waterworks, Portrush	Portrush U.D.C.	Office of Council, Town Hall, Portrush	do.
Church, Sallins, Co. Kildare	Very Rev. V. Byrne	Slevin & Son, Surveyors, 16, Dame-street, Dublin	do.
Materials	Haslingden Town Council	J. S. Green, Borough Surveyor, Municipal Offices, Haslingden	do.
Stone	Droitwich Corporation	H. Hulse, Borough Surveyor, Town Hall, Droitwich	do.
Stores, Fittings, etc.	Southampton Corporation	Traffic Manager, Tramway Office, Above Bar-street, Southampton	do.
Peniston Sewage Scheme (Contract No. 4)	Peniston U.D.C.	Spinks & Pilling, Engineers, 20, Park-row, Leeds	do.
Materials	Yardley R.D.C.	A. W. Smith, Engineer, Council House, Sparkhill, Birmingham	do.
Sewage of Acock's Green, South-East	do.	do.	do.
Four Houses at Mainhead-view, Exmouth	.....	Messrs. Crews & Son, Rolle-street, Exmouth	do.
9 miles of Water Pipes, Highbridge Water Supply	Axbridge U.D.C.	A. Powell, Engineer, 3, Unity-street, College Green, Bristol	Mar. 13
Reservoir and Contingent Works	do.	do.	do.
Tools	Berkshire C.C.	J. F. Hawkins, County Surveyor, Bank-chbrs., Cross-st., Reading	do.
Permanent Way Works (Tramways)	Stockport Corporation	J. Atkinson, Borough Surveyor, Stockport	do.
Granite	Lichfield R.D.C.	C. O. Rawstron, District Surveyor, Lichfield	do.
Tools, Oils, etc.	do.	do.	do.
Renewal of Superstructure of Four Under Bridges	Caledonian Railway Co.	Engineer, General Station, Perth	do.
Bonnybridge Sewage Disposal	Stirlingshire Eastern District Com.	Warren & Stuart, C.E., 94, Hope-street, Glasgow	do.
Wargrave Sewage Disposal	Wokingham R.D.C.	R. Hassard, Engineer, 1, Victoria-street, Westminster, London	do.
Materials	Erith U.D.C.	C. H. Fry, Clerk, Council Offices, Bexley-road, Erith	do.
500 tons of Cement	Manchester Rivers Committee	Secretary of Rivers Department, Town Hall, Manchester	do.
Jobbing Repairs, Workhouse, Brownlow Hill	Liverpool Select Vestry	H. J. Hagger, Parish Offices, Brownlow Hill, Liverpool	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be Delivered
Engine House, etc., at Metton, near Cromer	Cromer U.D.C.	J. C. Mellis, Engineer, 264, Gresham House, Old Broad-street, E.C.	Mar. 13
*Caretaker's Quarters, Enfield and Willesden	Middlesex C.C.	County Architect, Middlesex Guildhall, Westminster, S.W.	do.
Rebuilding Station Offices at Whiffler	Caledonian Railway Co.	Engineer to Company, 16, Killermont-street, Glasgow	do.
Three Workmen's Dwellings, Manor-grove	Richmond Town Council	J. H. Brierley, Borough Surveyor, Town Hall, Richmond, Surrey	do.
Carriage Underframes and Body Iron Work	Secretary of State for India	Director-General of Stores, India Office, Whitehall	Mar. 14
Materials	Hampton U.D.C.	S. H. Chambers, Surveyor, Public Offices, Hampton, Middlesex	do.
Branch Library at Castleton	Rochdale Libraries Committee	J. Horsfall, F.R.I.B.A., 4, Chapel-walks, Manchester	do.
Extension of Gas Mains to Wrecclesham	Farnham Gas Co., Ltd.	Company's Offices, East-street, Farnham	do.
Completion of a Covered Conduit	Liverpool Water Committee	Water Engineer's Office, Municipal-buildings, Liverpool	do.
Materials	Sutton Coldfield Corporation	W. A. H. Clarry, Borough Engineer, Council House, Sutton Coldfield	do.
Additions, etc., to "Nazareth" Chapel, Aberdare	.....	T. Roderick, Architect, Ashbrook House, Clifton-street, Aberdare	do.
Materials	Wembley U.D.C.	W. Bagshaw, Clerk, Public Offices, Wembley	do.
Broken Granite, Gravel, Hoggin	do.	do.	do.
Machine-broken Granite, etc.	Long Crendon R.D.C.	E. Parry, Surveyor, Long Crendon, Thame	do.
Rebuilding the Kebroyd Mills, Triangle, Halifax	Trustees of the late G. B. Hadwen	Jackson & Fox, Architects, 7, Rawson-street, Halifax	Mar. 15
725 yds. of Stoneware Sewers and Manholes	Ledbury Freehold Building Society	R. G. Gurney, Surveyor, Worcester-road, Ledbury	do.
Road from Bye-street to Oatley's-lane	do.	do.	do.
Road Materials and Carting	Tutbury R.D.C.	C. F. Chamberlin, Clerk, Council Offices, Union Offices, Burton-on-Tt.	do.
Restoring and Additions, Parish Church, Llanelly	Rev. D. W. Morgan	E. M. Bruce-Vaughan, F.R.I.B.A., Cardiff	do.
Hospital, Gateside, Greenock	Greenock Hospital Board	C. Macculloch, Clerk, Municipal-buildings, Greenock	do.
School for 900, Canton Market Estate	Cardiff Education Committee	James & Morgan, Architects, Charles-street-chambers, Cardiff	do.
Materials	Blackpool Highways Committee	J. S. Brodie, Borough Engineer, Town Hall, Blackpool	do.
Road Materials	Eastbourne R.D.C.	T. E. V. Kirtlan, Clerk, 92, Terminus-road, Eastbourne	Mar. 16
*Stock Bricks, Deals, Pitch Pine, and Poling Boards	Lambeth Borough Council	Borough Engineer, 346, Kennington-road, S.E.	do.
Materials	Godstone R.D.C.	J. George Powell, Engineer, R.D.C. Offices, Godstone, Surrey	Mar. 17
*New Royal Naval Reserve Buildings, Portree	Admiralty	Director of Works Department, 21, Northumberland-avenue, W.C.	do.
Widening Wardsend Goit Bridge, Wortley	West Riding C.C.	F. G. Carpenter, County Surveyor, County Hall, Wakefield	Mar. 18
Rebuilding Barkisland Mill Bridge, near Halifax	do.	do.	do.
Materials	Burnley Highways Committee	G. H. Pickles, Borough Engineer, Town Hall, Burnley	do.
Stores	Epsom U.D.C.	Surveyor's Office, Bromley Hurst, Church-street, Epsom	do.
*Two Cottages for Firemen, Westbourne-road	Beckenham U.D.C.	Council's Surveyor, Beckenham	Mar. 20
Water Softening Works at Pumping Station	Sutton District Water Company	W. Vaux Graham, Engineer, 5, Queen Anne's-gate, Westminster	do
Bridge at Chipping Norton Junction	Great Western Railway Co.	Engineer, Paddington Station, London	Mar. 21
Reconstruction of a Bridge at King's Sutton	do.	do.	do.
Flints	Tendring R.D.C.	J. Bell, Highway Surveyor, Weeley, Colchester	do.
Extension of Harbour	Stonehaven Harbour Trustees	J. B. Cunningham, Clerk to Trustees Stonehaven	do.
Semi-detached Villas, Station Field, Pontypool	.....	D. J. Longher, Architect, Bank-chambers, Pontypool	do.
*Builders & Cabinet-makers Work, etc., Crown Court	County of Kent	County Architect, 86, Week-street, Maidstone	do.
Quarry Hill Improvement	Leeds Corporation	City Engineer's Office, Municipal-buildings, Leeds	Mar. 22
Sewage Disposal Works, etc., Cefn	Wrexham R.D.C.	J. Price Evans, Engineer, Argyle-chambers, Wrexham	do.
School, Cwmcuffin, Llanhilleth	Abertillery U.D.C.	Swash & Bain, Architects, Midland Bank-chambers, Newport, Mon	Mar. 23
Primitive Methodist School and Vestry, Washington	Rev. M. S. Pickering	Davidson & Phillipson, Architects, 32, Clayton-st., W., Newc.-T.	Mar. 24
Elementary School Buildings, Wimborne-road	Poole Education Committee	W. Andrew, Architect, Parkstone	do.
Derwent Aqueduct, Grindleford to Rowsley	Derwent Valley Water Board	E. Sandeman, Engineer, Bamford, near Sheffield	Mar. 27
58 tons of 9-in. Cast-Iron Pipes	Welwyn (Herts) R.D.C.	H. Walker & Son, Engrs., Albion-chambers, King-st., Nottingham	do.
Infectious Diseases Hospital, Meadow Side, Alvie	Inverness-shire C.C.	A. Cattanach, Architect, Kingussie	Mar. 31
Steel Rails and Fish Plates, Victorian Railways	.....	Agent-General for Victoria, 142, Queen Victoria-st., London, E.C.	April 10
Wesleyan Chapel, Crosland Moor, Huddersfield	.....	W. J. Morley & Son, Architects, 269, Swan-arcade, Bradford	No date.
Wesleyan Chapel and Schools, Sandal, Wakefield	.....	Garside & Pennington, Architects, Ropergate House, Pontefract	do.
Road Formation, etc., Chester	.....	J. Little, Engineer, Viaduct-chambers, Carlisle	do.
Excavating a Reservoir, 30 yds by 30 yds	.....	Agent & Manager, Ibstock Collieries, Ltd., near Leicester	do.
Alterations to Llandaff House	.....	W. H. Dashwood Caple, Architect, Church-street-chambers, Cardiff	do.
Llandaff Theological College (1st Section)	.....	Mr. Kempson, 16, High-street, Cardiff	do.
*New Cotton Exchange, Liverpool	.....	Matear & Simon, Century-buildings, North John-street, Liverpool	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*Two Architect's Assistants	Glamorgan C.C. Education Comm.	2*l.* 10s. per week	Mar. 7
*Clerk of Works	Hull Corporation	3*l.* 10s. per week	Mar. 10
*Engineer to Public Health Department	Corporation of London	1,000*l.*	Mar. 18

Those marked with an (*) are advertised in this number. *Competitions*, —. *Contracts*, iv. vi. viii. x. *Public Appointments*, xxi.

TENDERS—*Continued from page* 251.

LLANHILLETH.—For erecting thirty-five houses on Blaencuffin-road for the Maesycnew Building Co., Ltd. Mr. Dan Lloyd, architect:—

David Lewis, Aberbeeg £7,000

LONDON.—For finishing of roadways of Section A, White Hart-lane Estate, for the London County Council:—

T. Adams	£3,157 18 5	W. Manders	£2,872 10 7
Muirhead, Greig, & Matthews	3,036 16 4	O. T. Gibbons	2,827 0 0
J. Mowlem & Co., Ltd.	2,966 0 0	F. J. Coxhead	2,760 0 0
E. T. Bloomfield	2,930 5 3	Grounds & Newton	2,687 13 5
W. Griffiths & Co., Ltd.	2,875 2 6	E. J. Knifton, Hope-yard, Laughedge-lane, Edmonton*	2,467 12 1

[The estimate comparable with the tender is £3,033.]

LONDON.—For the erection of two shops, Lea Bridge-road, London, N.E. Mr. Herbert Riches, architect, 3, Crooked-lane, King William-street, London, E.C. Quantities supplied:—

Courtney & Fairbairn	£3,259 0	Clemens Bros.	£3,070 10
F. & T. Thorne	3,155 0	Todd & Newman	3,033 0
Battley, Sons, & Holness	3,130 0	F. Osborn & Son	2,989 0
		Sheffield Bros.*	2,950 0

LONDON EDUCATION COMMITTEE TENDERS.

Reconstructing the heating apparatus and extending it to the new classrooms and halls, Clapham, Sleaford-street (heating apparatus).

Wright Bros.	£684 10	Stevens & Sons.	£585 0
G. N. Haden & Sons	659 0	R. Clarke	557 0
G. N. Haden & Sons‡	648 0	G. & E. Bradley, 68, Elfort-road, Highbury*	539 10
W. G. Cannon & Sons	599 0		

[‡ Alternative tender.]

Stepney, Senrab-street (New School).

Under the direction of the late authority preliminary plans of a school for 856 children were prepared, and have been approved by the Board of Education, the description of the plans being as under:—Accommodation: Boys', 274; girls', 274; infants', 308; total, 856. Graded school on three stories—Halls: Boys', 53 ft. by 28 ft. 9 in.; girls', 53 ft. by 28 ft. 4½ in.; infants', 53 ft. by 28 ft. Classrooms: Boys', 50, 48, 48, 48, 40, 40; girls', 50, 48, 48, 48, 40, 40; infants', 56, 56, 50, 50 (babies' room), 48, 48. Drawing classroom, 564 sq. ft. area; science room, 564 sq. ft. area. Heating by low-pressure hot-water apparatus and open fires. Area of site, 41,125 sq. ft. Playgrounds, area per child—boys', 53 sq. ft.; girl's' and infants', 32 sq. ft. It is proposed that one of the houses adjoining the site shall be used for the accommodation of the schoolkeeper.

T. Rowbotham	£24,575	0	0
Sabey & Son	23,515	0	0
J. Shelbourne & Co.	22,670	0	0
A. E. Symes	22,461	10	4
W. Johnson & Co., Ltd.	22,417	0	0
E. Lawrance & Sons	22,185	0	0
B. E. Nightingale	21,971	0	0
Higgs & Hill, Ltd.	21,963	0	0
J. Appleby & Sons	21,744	0	0
J. Garrett & Son	21,720	0	0
Stimpson & Co.	21,700	0	0
Wisdom Bros.	21,681	0	0
Treasure & Son	21,674	0	0
Martin, Wells, & Co., Ltd.	21,346	0	0
F. & T. Thorne	21,273	0	0
J. Smith & Sons, Ltd.	21,196	0	0
Rowley Bros.	21,172	12	0
Oak Building Co., Ltd.	20,899	0	0
J. & M. Patrick, Point-pleasant, Wandsworth*	20,662	0	0

[The architect's estimate comparable with these tenders is £18,926. The school is planned for future extension by 332 places (viz., boys', 108; girls', 108; infants', 116, making a total of 1,188), and the tenders for the portion now to be built include the provision of halls of sufficient size for the school when enlarged, and also teachers' rooms, cloakrooms, lavatories, etc., for the complete school.]

LONDON.—For alterations and additions to the receiving wards and stables at the Ladywell Workhouse, Ladywell, S.E., for the Bermondsey Guardians. Messrs. Newman & Newman, architects, 31, Tooley-street, S.E.:—

W. Reason, 47, Rosebery-avenue, E.C. £299

NORWICH.—For kerbing, channelling, metalling, etc., Winter-road and part of Stafford-street, for Messrs. Winter. Messrs. Morgan & Buckingham, surveyors. Quantities by surveyors:—

H. S. Watling	£810 0 0	F. J. Hipperson	£780 12 6
E. Howes	791 18 8	G. Rackham	686 0 0
W. J. Hannant	786 0 0	E. J. Edwards	604 0 0

[All of Norwich.]

[Estimated cost £700.]

PLAISTOW.—For the extension of Public Baths Balaam-street, for the West Ham Corporation:—

H. C. Horswill	£3,063	Works Manager, Canning Town*	£2,456
J. G. Horlock	2,668	A. G. Crisp	2,440
A. E. Symes	2,550	W. Manders	2,425
Gregar & Son	2,480		

PLYMPTON (Sussex).—For making up road, etc., at Sedgbrook, for the East Sussex Western Smallpox Hospital District Committee. Mr. Macarthur, surveyor, Hayward's Heath. Quantities by surveyor:—

E. H. King	£188 3	W. Knight, jun.	£173 0
S. Carey	180 0	S. Packham, Burgess Hill*	165 0
C. Mayo	176 7		

STRATFORD.—For making-up Totnes-road and Charford-road, for the Borough Council:—

D. T. Jackson	£972 12 8	J. Jackson	£904 9 6
Hewett & Sons	968 12 8	G. J. Anderson	835 9 2
T. Adams	959 9 2	Parsons & Parsons, Ilford*	779 19 7
W. Griffiths	935 0 5		

STRATFORD.—For alterations to prisoners' cells, Quarter Session Court, West Ham-lane, for the Borough Council:—

Gregar & Son	£368	W. Manders	£250
Works Manager	364	A. E. Symes, Stratford*	210
J. Quarterman	293		
H. C. Horswill	284		

TOTTENHAM.—For making-up Crowland-road (2nd section), Kent-road, Lansdowne-road, and Woodside-gardens, for the Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham:—

—	Crowland-road (2nd section).	Kent-road (remainder).	Lansdowne-road (remainder).	Woodside-gardens (part of).
	£ s. d.	£. s. d.	£ s. d.	£ s. d.
E. Knifton	522 9 10	138 18 4	1,441 8 9	244 13 4
Grounds & Newton, Tottenham	436 17 0	126 2 6	1,298 0 3*	264 1 4
T. Rowley, jun.	—	—	1,414 14 2	234 12 3
C. Bloomfield, Tottenham	433 12 6	120 7 7*	1,339 0 0	213 4 0
E. T. Bloomfield, Tottenham	368 12 0*	122 13 6	1,301 17 0	207 0 6½*

ST. STEPHEN'S-BY-SALTASH.—For laying sewer for the St. Germans Rural District Council. Mr. S. P. Hosking, surveyor, Landrake, St. Germans:—

A. Smith, Saltash £149

SALTBURN-BY-THE-SEA.—For making-up private streets, for the Urban District Council. Mr. G. S. L. Bains, C.E., Surveyor:—

Asphaltic Limestone Concrete Co., Ltd.	£5,521 14 10	Hardy & Atkinson	£3,560 9 0
Starkey	5,139 19 10	Burn	3,467 13 10
Hunt	4,819 15 7	Inglett	3,432 2 0
Hadfield & Co.	4,814 4 9	Shepherd	3,426 9 5
Robson	4,793 8 6	Pickering	3,352 2 4
Crombie & Son	4,521 1 9	North of England Asphalte Co.	3,311 9 10
Smiles	4,402 6 3	Hobbs	3,293 6 9
Cruddas & Son	3,954 8 5	O'Doherty & Son	2,950 2 0
Short	3,814 17 11	Ellison, Cleckheaton*	2,944 12 10
Simpson	3,697 2 5		
Meredith	3,603 19 4		

STANLEY.—For laying sewers, West Shield-row and East Stanley, for the Urban District Council. Mr. J. Routledge, Surveyor, Council Offices, Stanley:—

	West Shield-row.	East Stanley.
J. Meredith	£559 3 6	£404 17 6
D. Champney	618 2 0	375 13 4
J. Robson	490 2 0	323 0 0
W. Carr	527 13 8	343 0 10
J. Thompson	479 5 2	310 11 10
P. Frater	532 18 6	354 18 0
J. McLaren	557 10 0	353 17 6
A. & A. Storey	612 14 6	424 4 0
A. Routledge	513 14 0	344 5 0
J. Nevin	513 5 0	366 12 6
W. J. Edgar	616 17 0	447 5 0
Johnson & Strong, Stanley, R.S.O.*	456 3 0	305 8 4
R. Hudson	607 0 2	382 16 8
W. Ayton & Sons	511 16 10	344 16 8
W. Johnson, Jr.	530 1 6	367 5 0

TOTTENHAM.—For erecting refreshment pavilions and dressing and store-rooms, Bruce Castle, Downhills and the Chestnuts Parks, for the Urban District Council. Mr. W. H. Prescott, Engineer, Coombes Croft House, 712, High-road, Tottenham:—

S. Kind	£1,450 0 0 / 1,452 6 4	Pollard & Brand	£1,310 0 0 / 1,310 4 11
Boulton & Paul	1,341 0 0 / 1,341 16 0	A. Porter	1,155 0 0 / 1,158 8 5

NOTE.—The second line of figures denotes alteration in quantities after being checked by engineer's department.

[No tender accepted. Council agreed to carry out the work in their own works department.]

WALTHAMSTOW.—For Winns-avenue Schools, for the Walthamstow Education Committee. Mr. H. Prosser, Architect to the Committee:—

Oak Building Co.	£28,779	Shurmur	£25,983
M. Wells & Co.	28,353	Kerridge & Shaw	25,955
Rowley Bros.	27,800	R. & E. Evans	25,885
C. Wall, Ltd.	27,554	W. Manders	25,584
C. Roper	26,999	Maddison	25,163
H. J. Carter	26,829	F. & E. Davey	24,987
Treasure & Son	26,600	W. Lawrence	24,844
A. E. Symes	26,500	Kilby & Gayford	24,583
Pollard & Brand	26,483	Hammond & Son, Romford*	23,881
Knight & Son	26 362		
Coxhead	26,220		

WALTHAMSTOW.—For heating apparatus, Warwick-road Schools, for the Walthamstow Education Committee. Mr. H. Prosser, Architect to the Committee:—

Korting Bros.	£725 0	Price, Lea, & Co.	£540 0
J. Grundy	684 0	Palowkar	532 0
Dargue, Griffiths, & Co.	621 10	Russell & Co.	500 0
Cassidy	615 0	Wontner-Smith & Gray	462 0
Rosser & Russell	596 0	Musgrave	452 0
W. J. Fox	560 5	J. Jones & Son	408 0

WIDNES.—For the enlargement of Simm's Cross Council School, for Widnes Education Committee. Mr. F. U. Holme, architect, Westminster-chambers, 1, Crosshall-street, Liverpool:—

Jones & Son	£2,500	Rothwell & Sons	£1,911
J. Merritt	2,062	Duthie & Dobson	1,910
Holme & Green	2,040	T. Fairclough	1,870
S. Webster	2,007	Hughes & Sterling	1,850
F. W Mayor	1,999	Lucas & Son	1,835
W. Hall & Son	1,949	J. & E. Rimmer, Gateacre, Liverpool*	1,781
P. Tyson	1,937		
J. Gerrard & Son	1,915	Parker & Son	1,775
G. Woods & Son	1,915		

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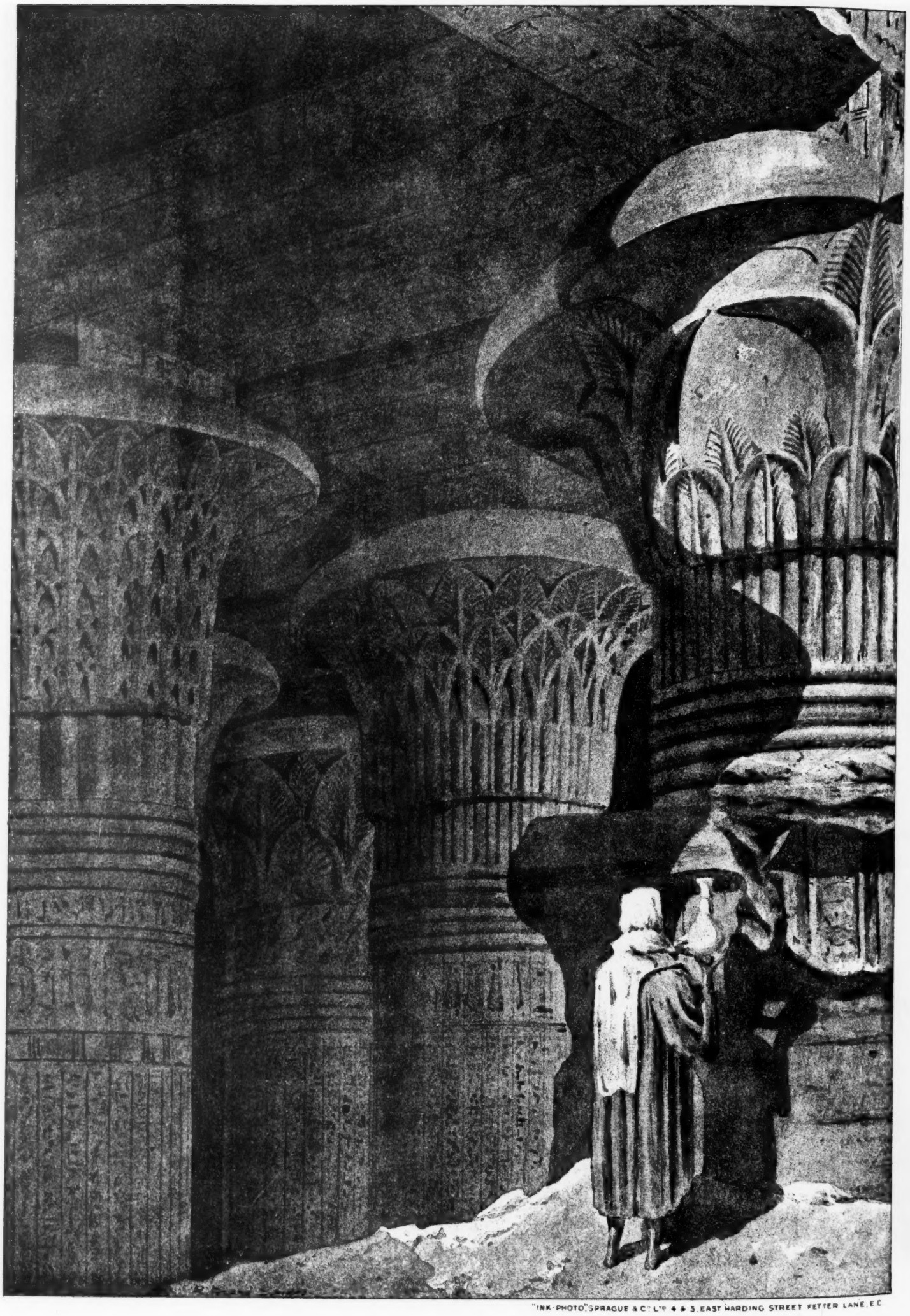

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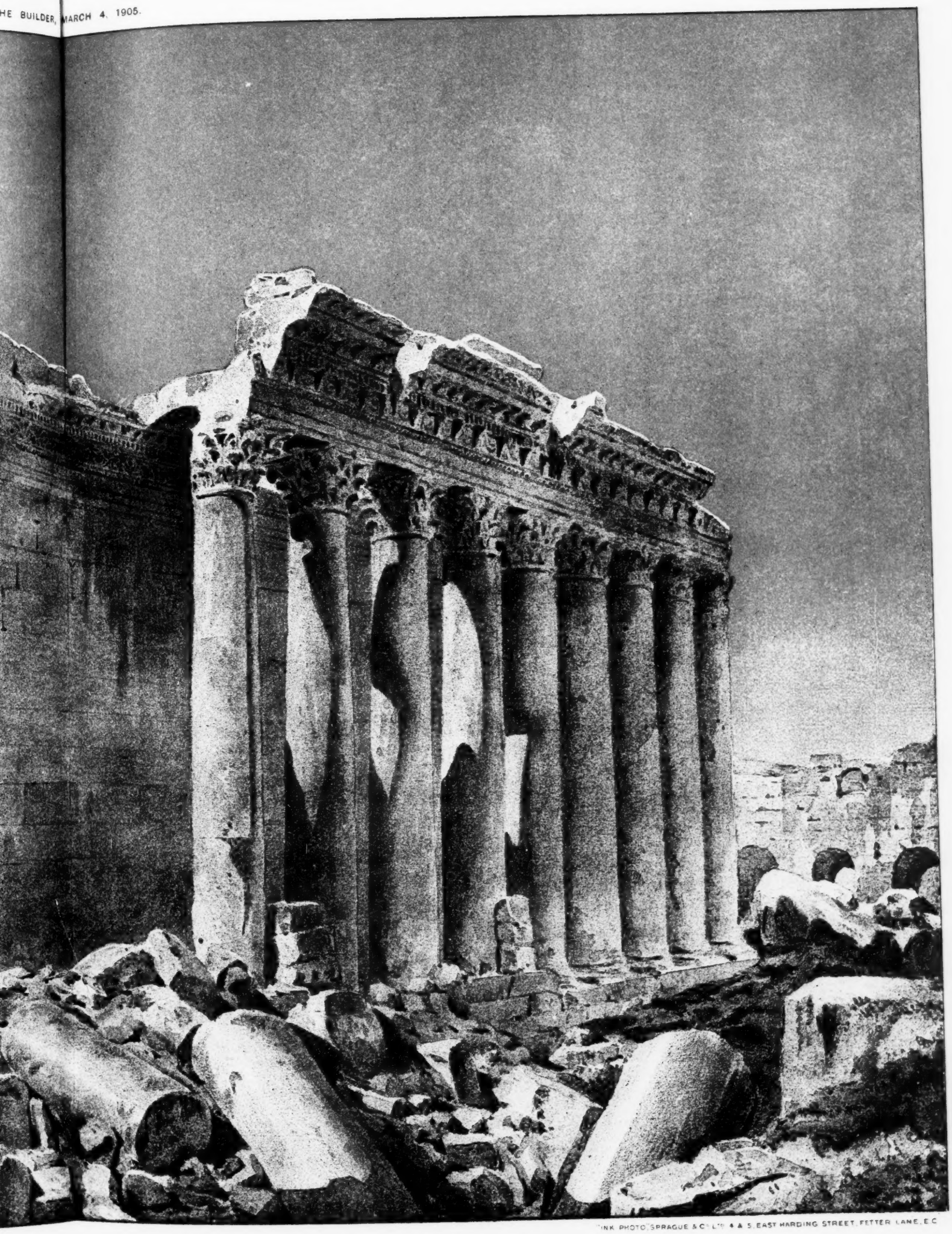

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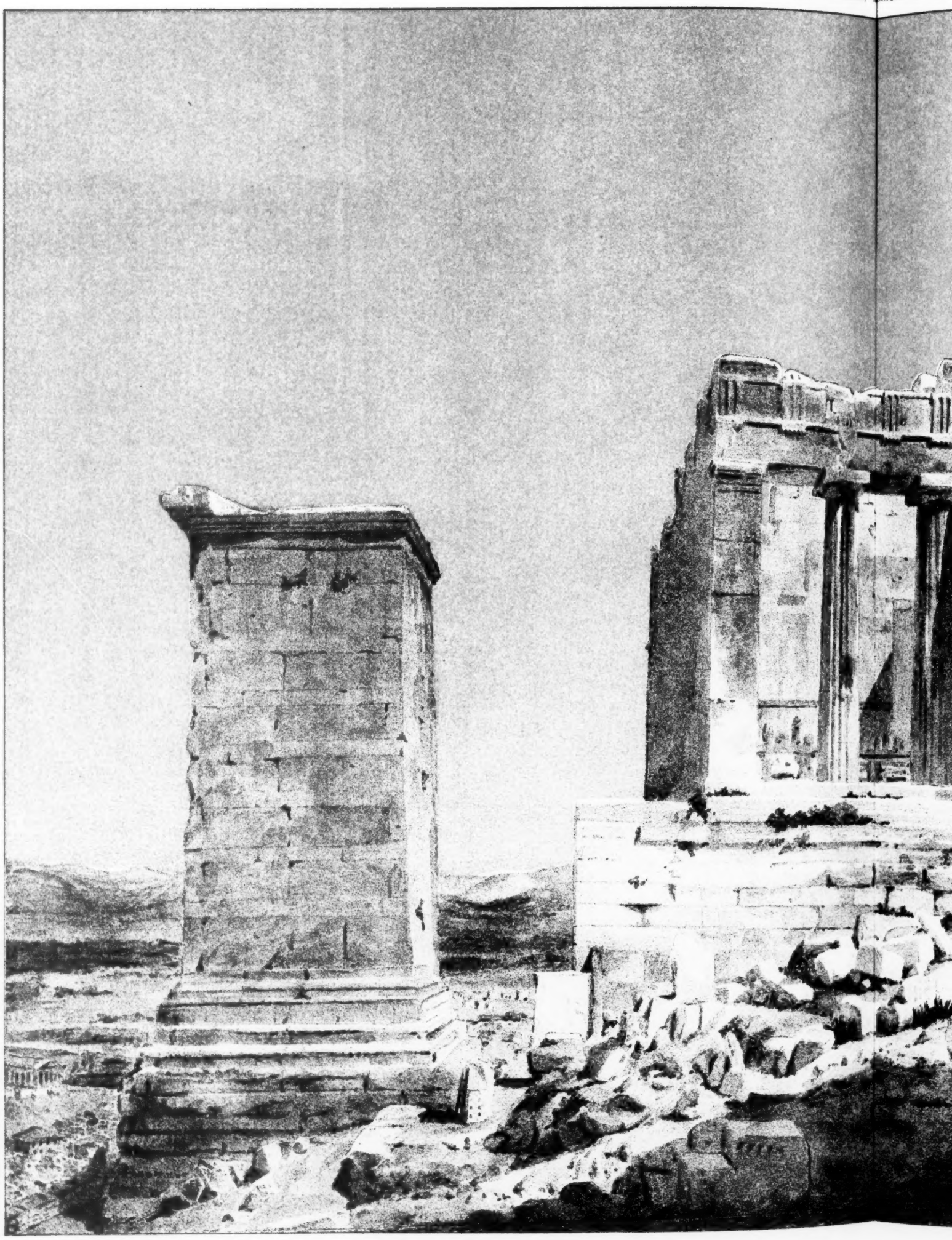

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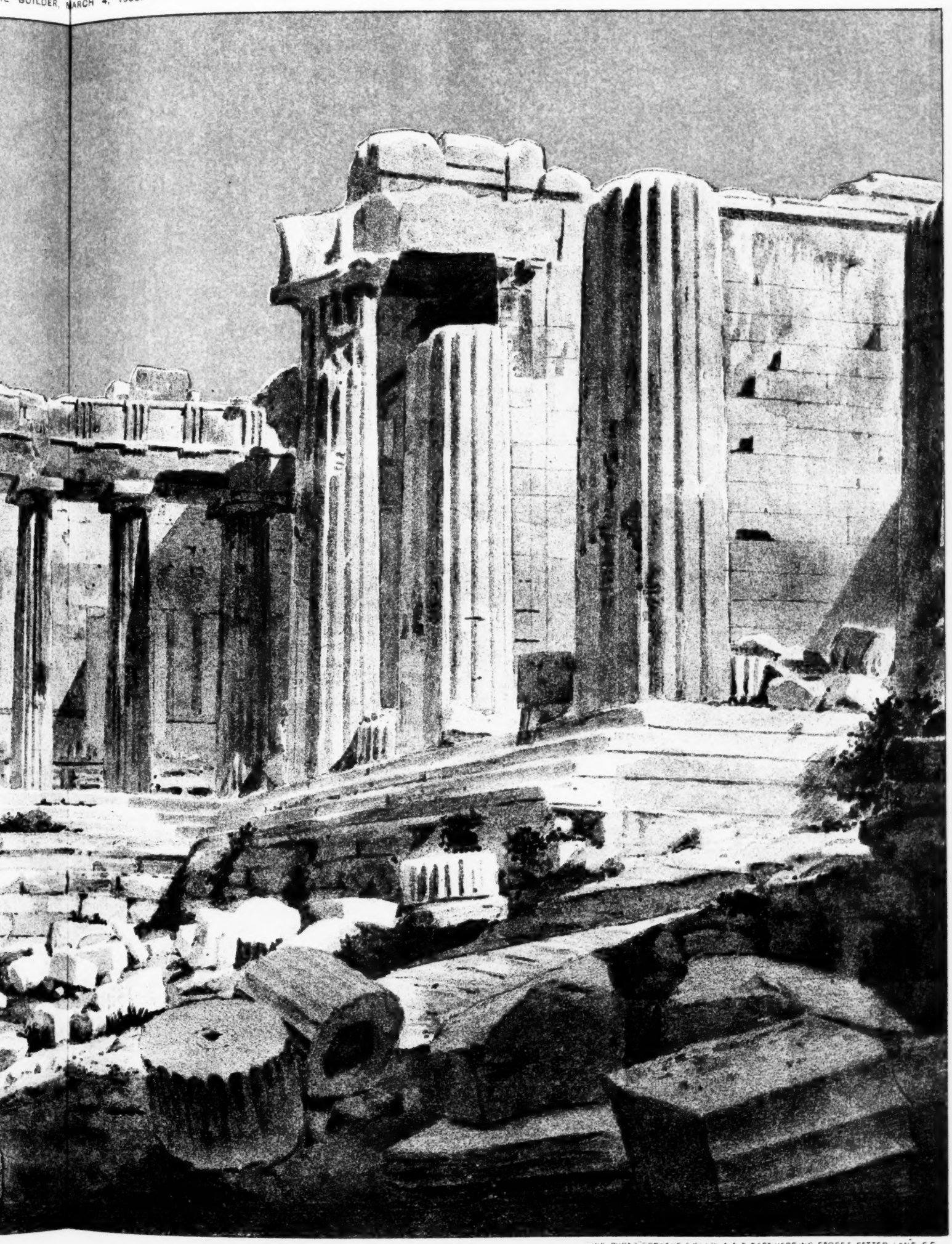

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4. 1905.

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ENÉ SPIERS, FEBRUARY 27, 1905.